UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
HRP-8J

JUN 16 1995

CERTIFIED MAIL: P 644 397 520
RETURN RECEIPT REQUESTED

Fred G. Nicar, General Manager
Chemical Waste Management, Inc.
Vickery Facility
3956 State Route 412
Vickery, Ohio 43464

RE: **Notice of Deficiency (NOD)**
Chemical Waste Management, Inc. Vickery Facility (CWM-Vickery)
RCRA Facility Investigation (RFI) Workplan
OHD 020 273 819

Dear Mr. Nicar:

The United States Environmental Protection Agency (U.S. EPA) has reviewed CWM-Vickery's RFI Workplan prepared by RUST Environment & Infrastructure for the Chemical Waste Management facility in Vickery, Ohio. The U.S. EPA comments on the RFI Workplan have been divided into two sections: RFI Workplan comments and Quality Assurance Project Plan (QAPP) comments.

CWM-Vickery shall respond to both sets of comments within 30 days after receipt of this letter. The modified RFI Workplan shall be prepared in accordance with the following editorial protocol or convention:

1. Old language is overstruck.

2. New language is capitalized.

3. Page headers must indicate date of submission.

4. If any significant changes are necessary, pages should be renumbered, table of contents revised, and complete sections provided as required.

5. An itemized list of all replacement pages, sections, tables, etc. that are to be replaced in the modified submission,shall be provided.

In addition to four copies of the modified submission required by the U.S. EPA, please send one copy of each to:

Edwin Lim
Ohio EPA, DHWM
P.O. Box 1049
1800 WaterMark Drive
Columbus, OH 43266-0149

Chuck Hull
Ohio EPA, NWDO
347 N. Dunbridge Rd.
Bowling Green, OH 43402

CWM-Vickery
Information Repository

If you have questions please contact me at (312) 886-7569.

Sincerely,

Thomas Matheson
Corrective Action Project Manager
RCRA Permitting Branch

cc: Ed Lim, OEPA/CO
Chuck Hull, OEPA/NEDO

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CONCURRENCE REQUESTED FROM RPB			
SC/BR SECRTY			
OTHER STAFF	RPB STAFF	RPB SECTION CHIEF	RPB BRANCH CHIEF
6/15/95 PB	6/15/95	6/15/95	

TECHNICAL REVIEW COMMENTS ON THE QUALITY ASSURANCE PROJECT PLAN FOR THE RCRA FACILITY INVESTIGATION AT THE CWM-VICKERY FACILITY

The U.S. EPA, reviewed the quality assurance project plan (QAPP) for the Resource Conservation and Recovery Act (RCRA) facility investigation (RFI) at the Chemical Waste Management facility in Vickery, Ohio, (CWM-Vickery). The QAPP was prepared by CWM-Vickery's consultant, Rust Environment & Infrastructure, Inc. (Rust), and was submitted to the U.S. Environmental Protection Agency (EPA) Region 5 in April 1995.

The QAPP contains extensive deficiencies, inaccuracies, and inconsistencies. Because these deficiencies, inaccuracies, and inconsistencies are so extensive, only examples of these issues are presented in the general and specific review comments provided below. These examples should not be considered the only portions of the QAPP that need revision. The QAPP should be thoroughly revised in accordance with the U.S. EPA Region 5 Model RCRA QAPP (Model QAPP) dated May 1993. The QAPP should be revised to be a stand-alone, project-specific document, except that the field sampling plan (FSP) may be used to present sampling procedures (see Section 4 of the Model QAPP). In addition to the Model QAPP and FSP, U.S. EPA's comments that were discussed during the pre-QAPP meeting on January 17, 1995, and the U.S. EPA letter discussing proposed SWMU/AOC grouping and project objectives, dated April 1995, were used to evaluate the adequacy of the QAPP.

GENERAL COMMENTS

1. The project objectives presented in Section 1 of the QAPP do not contain sufficient details. Because of this, it is difficult to evaluate the adequacy of the proposed sampling and analysis program. Individual project objectives should be presented for each solid waste management unit (SWMU) group and area of concern (AOC). These objectives should clearly identify each sample matrix to be investigated, field parameters, laboratory parameters, specific action levels to which results will be compared and actions to be taken based on these comparisons.

2. Section 1 of the QAPP proposes collecting only soil and sediment samples and does not provide adequate rationale for not collecting groundwater samples. This approach seems to be inadequate for accomplishing the overall project objectives of verifying and further defining the nature and extent of contamination, as stated in Section 1 of the QAPP. As discussed during the pre-QAPP meeting, the QAPP must state whether it is an objective to determine the extent of the groundwater plume or to merely confirm the existence of the plume. In either case, the QAPP should be revised to include groundwater sampling or to thoroughly explain how the project objectives will be accomplished without collecting groundwater samples.

3. The QAPP does not clearly or logically describe the proposed phased approach to the RFI. Although Section 1.1.2 briefly describes proposed Phase II activities, this phase is not specifically addressed in other sections of the QAPP. For example, it is not clear whether the sampling and analytical quality control (QC) procedures described in the QAPP apply to all RFI phases or just to Phase I. The revised QAPP should clearly describe and justify the respective QAPP elements that apply to each phase of the RFI,

and should further explain whether a separate QAPP will be submitted for Phase II or if the QAPP under review is applicable to both phases.

In addition, Section 1.1.2, page 3 of 14, paragraph 3 states that additional RFI Phase II activities may include installing additional monitoring wells and conducting a detailed groundwater investigation. It appears that the need for collecting additional groundwater data during Phase II will be based on a review of existing groundwater data gathered during Phase I. However, reviewing existing data is not a field activity that is covered by a QAPP. Existing data should be reviewed before Phase I activities to determine whether additional groundwater data should be collected during Phase I. This determination should be discussed in the QAPP.

The QAPP also includes treatability studies and pilot testing as possible Phase II activities. However, these activities typically provide data that is used for corrective measures and is typically beyond the scope of an RFI.

4. The QAPP does not clearly explain the intended use of RFI data. For example, Section 1.4.2, page 12 of 14, paragraph 2 indicates that "data shall be compared to background soil levels, or to measured detection limits and other (low level) health based criteria." However, the QAPP does not quantitatively identify detection limits, background soil levels, and other low-level, health-based criteria. These action levels should be identified for each target analyte and sample medium. The revised QAPP should describe the process used to determine background soil levels and should reference the source of any "health based criteria" that will be used for this RFI. This information should be provided to demonstrate that background soil levels will represent appropriate action levels for this project. The QAPP should also specify how comparisons of RFI data with all action levels or data quality levels will affect decisions regarding future corrective actions at specific SWMUs and AOCs.

   The intended use of existing groundwater data is not addressed. As discussed during the pre-QAPP meeting, after existing groundwater data is validated, its intended use must be addressed. In particular, the QAPP should quantitatively identify groundwater action levels and compare existing groundwater data with these action levels. If existing groundwater data is inadequate for determining corrective actions, then the revised QAPP should describe in detail how and where additional groundwater data will be collected.

   In addition, the QAPP should demonstrate that the data quality will be sufficient for the data's intended use. To demonstrate this, the QAPP should show that the type and amount of QC (such as reporting limits, QC check samples, control limits, and data deliverables) applied to groundwater and soil data will be adequate for the intended use of the data. For example, a greater amount of QC should be applied to data collected for risk assessment purposes than to data collected for screening purposes.

5. The QAPP proposes to use existing data along with data generated during the RFI to make decisions about further corrective actions at the facility. For example, Section 1.1.2, page 3 of 14, paragraph 2 states that Phase I RFI

data will be evaluated in conjunction with existing data to determine whether additional investigation is necessary. However, the QAPP contains no quantitative summary of the existing data. The QAPP should include a summary of existing data and a discussion of the level of QC associated with data collection. Moreover, CWM-Vickery should demonstrate that the level of QC associated with any existing data that will be used for corrective action decision making is equivalent to the level of QC associated with the data that will be generated during the RFI.

6. The Model QAPP provides generic language, but clearly states that generic language should be deleted and replaced with pertinent, site-specific information. The CWM-Vickery QAPP includes large sections of generic language that is taken verbatim from the Model QAPP. However, much of this generic verbatim text is not applicable to the CWM-Vickery RFI. Examples of inapplicable generic text that is used in the CWM-Vickery QAPP include the following:

   - Table of Contents. The header listed in the table of contents of the CWM-Vickery QAPP labels the document as the "Region 5 Model QA Project Plan" dated May 1993.

   - Section 1.4, Page 11 of 14, Paragraph 1. Generic language copied in this paragraph refers to "RI/FS activities," but the CWM-Vickery QAPP is for RFI activities.

   - Section 1.5.2, Page 13 of 14, Paragraph 4. This entire paragraph is copied verbatim from the Model QAPP and states that maps showing surface water sampling locations and locations of monitoring and residential wells to be sampled are included in the QAPP. However, surface water and groundwater from monitoring wells and residential wells are not matrices that are to be sampled during the CWM-Vickery RFI.

   - Section 3.6, Page 5 of 5, Paragraph 1. Generic language copied in this paragraph discusses collection of aqueous matrix spike and matrix spike duplicate (MS/MSD) samples, but no aqueous samples are proposed to be collected for the RFI.

   - Section 6.2, Page 2 of 2, Paragraph 1. The text refers to the "Appendix to this Model QAPjP."

   - In several locations throughout the document, generic language that is copied verbatim from the Model QAPP refers to standard operating procedures (SOP) and their contents. The appendix to the CWM-Vickery QAPP does not include SOPs, but instead includes site-specific practices (SSP). The text should be revised to use consistent terminology.

7. Many SOPs consist of photocopies of specific SW-846 Methods such as Methods 8080A, 8270A, 8260A, and 6010A, and the 7000 series for metals. As stated in item 3 of the "Dos and Don'ts to Facilitate QAPP Approval" of the Model

QAPP, this practice is not acceptable. The QAPP should include text that details sample preparation and analysis SOPs demonstrating how CWM Riverdale National Laboratory will implement each project-specific method. These SOPs should contain all 14 elements listed in the Model QAPP, "Guideline for the Preparation of Standard Operating Procedures." These elements include method detection limits and precision and accuracy control limits that CWM Riverdale National Laboratory is capable of achieving for each project-specific parameter and sample medium.

In addition, the SSPs do not include all of the information referred to in the text when a reference to an SOP is made. In particular, the following references to SOPs and their contents were specified in the CWM-Vickery QAPP based on generic text that was copied verbatim from the Model QAPP, but the referenced information was not included in the SSPs:

- Section 3.1.3, Page 1 of 5. Precision control limits
- Section 3.2.3, Page 2 of 5. Accuracy control limits
- Section 6.2, Page 2 of 2. Calibration procedures, calibration frequency, acceptance criteria, and the conditions that will require recalibration
- Section 7.1, Page 1 of 1. Sample preparation, cleanup, and analysis
- Section 8.1, Page 1 of 2. Minimum laboratory QC requirements
- Section 11.1, Page 1 of 1, Paragraph 1. This paragraph states verbatim from the Model QAPP that field equipment for this project includes thermometers, pH meters, and conductivity meters, and later lists spare parts needed for these instruments; however, the only field equipment discussed in the FSP and elsewhere in the QAPP is a photoionization detector (PID).
- Section 13.2, Page 3 of 3. Conditions that automatically trigger corrective actions or optional procedures

8. As specified in the Model QAPP, Revision 0 should be identified on the title page and on each page header throughout the document.

SPECIFIC COMMENTS

The comments provided below refer to specific sections of the QAPP. Referenced sections of the QAPP are identified by section, page, paragraph, and line number, as appropriate. When paragraphs are cited, the first complete paragraph on a page is designated as "Paragraph 1." If comments are made on a paragraph that carries over from a previous page, the incomplete paragraph is designated as "Paragraph 0." When line numbers are cited, they refer to the line numbers of the paragraph cited.

1. **Title and Approval Page**. To comply with the requirements of the Model QAPP, this page should include the names of all individuals who will approve the QAPP, such as the Rust project manager and quality assurance (QA) officer and the CWM Riverdale National Laboratory QA manager. In addition, all dated signatures should be present except for those of EPA personnel.

2. **Table of Contents**. The list of appendixes at the end of the table of contents should identify the contents found in the appendix (for example, titles of individual SOPs contained in the appendixes). Following the list of appendices, a list of tables or figures should be presented. After these lists, a complete list of recipients of the QAPP should be provided.

3. **Section 1.1.1, Page 2 of 14, Paragraph 2, Bullets 1 and 2**. The project objectives state that data will be compared to state and federal regulatory criteria and provide examples of criteria that may used to conduct the comparison. However, specific criteria for individual parameters are not provided. The objectives should refer to a table that provides action levels for each target parameter.

4. **Section 1.1.1, Page 2 of 14, Paragraph 2, Bullet 1**. This bullet states that an objective of data collection will be to "verify and further define the nature and extent of contamination in previously identified on-site and off-site areas." However, the QAPP and FSP do not discuss any off-site sampling activities. This objective should be revised accordingly.

5. **Section 1.1.1, Page 2 of 14, Paragraph 2, Bullet 2**. This bullet states that one of the objectives of data collection is to determine the nature and extent of contamination in previously uninvestigated areas. However, it is not clear where these areas are located in relation to areas that have been investigated. The revised QAPP should include a figure that (1) identifies and distinguishes areas that were previously investigated from areas that were not, and (2) shows the locations of all SWMUs and AOCs within these areas.

6. **Section 1.1.2, Page 3 of 14, Paragraph 0, Bullet 1**. This bullet states that surface soil samples will be collected from depths of 0 to 18 inches, but the FSP states that surface soil samples will be collected from depths of 0 to 2 feet. This discrepancy should be resolved and the text revised accordingly.

7. **Section 1.1.2, Page 3 of 14, Paragraph 1**. This paragraph refers to "a limited number of samples" that will be analyzed for soil physical parameters. The exact number of samples to be analyzed for these parameters and the criteria used for selecting samples for these analyses are not discussed further in the QAPP or in the FSP. The text should be revised to include this information.

8. **Section 1.1.2, Page 3 of 14, Paragraph 2**. This paragraph states that Phase I data will be evaluated qualitatively and statistically in conjunction with existing data to determine the need for additional investigation. This paragraph should include details on what statistical procedures will be used

to evaluate data and what results will trigger the need for additional investigation. Also, the text should state that data will be evaluated "quantitatively" rather than "qualitatively."

9. **Section 1.2.1, Page 4 of 14, Paragraph 3.** This section briefly discusses the location of the CWM-Vickery facility. The Model QAPP calls for further information that was not presented, including the location of streets, rivers, and property bordering the facility, as well as the proximity of nearby large cities. This information should be provided; or, if it is provided in the RFI Workplan, the specific section of the workplan should be referenced.

10. **Section 1.3.1, Pages 5 and 6 of 14.** This section discusses the general history of the CWM-Vickery facility and refers to approvals granted to inject waste into subsurface wells and to construct a Toxic Substances Control Act (TSCA) closure cell. The text should specify the agency that granted these approvals and should include the date when the approval was granted.

    This section refers to site features including injection wells and surface impoundments. A site layout figure that shows the locations of these features should accompany this section.

    This section discusses the disposal of wastes in injection wells, surface impoundments, and a TSCA closure cell, and the closure of surface impoundments. This section should also discuss the types of wastes previously disposed of and the cleanup levels applied during closure of the surface impoundments.

11. **Section 1.3.1, Page 6 of 14, Paragraphs 1 and 3.** Paragraph 1 states that all of the 12 surface impoundments were closed between 1979 and 1992. However, paragraph 3 specifies that the Ohio Environmental Protection Agency (OEPA) certified five surface impoundments to be clean-closed. The revised QAPP should include the dates of closure of the other seven surface impoundments and whether OEPA approved the closures.

12. **Section 1.3.1, Page 6 of 14, Paragraph 2.** This paragraph states that landfarming activities and operation of an oil recovery facility were used to treat, store, and dispose of wastes. This paragraph should also discuss whether these units were permitted. If so, the agency granting the permit, the permit number, and the date when the permit was issued should be provided. If these units have been closed, this paragraph should discuss the closure and whether it was approved.

13. **Section 1.3.2.1, Page 7 of 14, Paragraph 1.** This paragraph refers to a permit issued in December 1981. The text should state the type of permit issued and the issuing agency.

14. **Section 1.3.2.1, Page 7 of 14, Paragraph 2.** The text states that "most of the parameters" were found to be below federal drinking water standards during a statistical analysis of groundwater quality data. The text should state specifically for what parameters analyses were performed.

15. **Section 1.3.2.2, Page 8 of 14, Paragraph 0**. This paragraph states that the results of additional and continuing studies from a 1983 geological review were to be presented when they were available. Due to the amount of time that has elapsed since the 1983 review, these results should be available and should be briefly discussed in text. Documents containing the complete results should also be referenced. If results are still unavailable, this should be stated clearly and the reason the results are not available should be explained.

16. **Section 1.3.2.3**. This section presents a summary of hydrogeological conditions; however, the information presented is inconsistent or deficient in some places. Examples of such inconsistencies and deficiencies include the following:

    - Bullet 1 states that the site is underlain by 40 to 50 feet of lacustrine clay and glacial till overburden. Bullet 3 states that the "confined aquifer and potentiometric surface is about 10 ft. to 15 ft. below ground surface." These statements present conflicting information regarding the depth of the confined aquifer.

    - Bullet 3 states that the water table in the overburden "is close" to the ground surface and that the overburden has a "very low" hydraulic conductivity. Both the depth to the water table and the hydraulic conductivity should be quantified.

    These inconsistencies and deficiencies in the text should be resolved. In addition, a cross-sectional drawing should be provided to further clarify the site hydrogeology.

17. **Section 1.3.2.3, Page 9 of 14, Paragraph 1**. This paragraph states that the groundwater flow in the overburden is "generally downward." Text on the previous page states that the overburden is generally 40 to 50 feet thick and that the water table in the overburden is close to the ground surface; therefore, it seems likely that the groundwater in the overburden would have a horizontal component to its flow direction. This horizontal direction should be stated or its absence should be further explained.

18. **Section 1.3.3, Pages 9 and 10 of 14**. The introductory paragraph to this section states that it will discuss target compounds; however, no target compounds are specifically identified. In particular, "a VOC" is referred to in paragraph 2 on page 10, and "hazardous waste" and "waste pile leachate" are referred to in paragraph 3 on page 10. The specific volatile organic compounds (VOC) and the hazardous constituents in the waste and leachate should be stated.

19. **Section 1.3.3, Page 9 of 14, Paragraph 2, Bullet 1**. This paragraph discusses releases of liquid wastes to soil and groundwater and states that the releases had little effect on the groundwater because of the low permeability of the clay soil and because many of the releases were immediately treated with lime and the contaminated soil was removed. The rationale for stating that the releases had little effect on soil is not

adequately supported by data. The permeability of the soil should be stated quantitatively, and other data, such as rainfall data and the results of confirmatory sampling, should be provided.

20. **Section 1.3.3, Page 10 of 14, Paragraph O, Bullet 2**. This paragraph discusses several large releases of liquid hazardous waste to both Little Raccoon Creek and Meyers Ditch and refers to "other releases" to surface water. The text also recommends analyzing stream bed sediments to characterize this medium. Although collecting one sample from Meyers Ditch is specified in the FSP, collecting samples of Little Raccoon Creek sediment is not specified in the QAPP or the FSP. The QAPP states that "subsequent testing of the creek [Little Raccoon Creek] water showed little contamination present." However, this statement implies that a water sample was collected but a sediment sample was not collected. Further, the action levels to which the data were compared are not provided. The QAPP should provide further information to justify why a sediment sample was not collected from Little Raccoon Creek; otherwise, this should be specified as a sampling location in the FSP. In addition, the name of the surface water body that received the "other releases" should also be specified, and, if other than Meyers Ditch or Little Raccoon Creek, sampling of this surface water body should also be specified.

21. **Section 1.4, Page 11 of 14, Paragraph 5**. This paragraph states that soil and sediment samples will be collected "at several of the SWMUs and all of the AOCs." These SWMUs and AOCs should either be listed in the text or the text should reference Table 5 of the QAPP. In addition, the FSP should be referenced for more information on the SWMUs comprising each SWMU group and the AOCs.

    This paragraph also states that sediment and soil samples will be analyzed for target compound list (TCL) and target analyte list (TAL) compounds using appropriate EPA methods, and that the list of compounds is included in Tables 1 through 4 in Appendix A. However, these tables are not found in Appendix A. The individual analytes, their method detection limits (MDL), and the corresponding EPA analytical methods and laboratory-specific SOPs should be provided in the appendix. The rationale for including these analytes as parameters for this project should also be provided.

22. **Section 1.4.2.1, Page 12 of 14**. This table in this section identifies the field parameter as "quantitative screening with photoionization detector," but does not indicate the parameter that will be measured by the PID. This section should state that the PID will measure organic vapors. In addition, Table 5 in Appendix A of the QAPP states that the PID will be used for qualitative screening of soil samples. The PID measures organic vapors but does not provide a direct quantitative measurement of individual VOC concentrations in soils. Therefore, the text should be revised so that it is consistent with Table 5 in Appendix A, which correctly states that the PID will be used for qualitative screening of soil samples.

23. **Sections 1.4.2.1 and 1.4.2.2, Page 12 of 14**. Both of these sections list soil as the only sample matrix, but sediment is discussed as another sample matrix on the preceding page of the QAPP and in the FSP. Although these are

considered to be the same medium for analytical purposes in the laboratory, they are distinct sample matrices for the RFI. Therefore, sediment should be included as a separate sample matrix in these sections.

24. **Section 1.4.2.2, Page 12 of 14**. Pesticides and polychlorinated biphenyls (PCB) are not included in the list of parameters in this section. However, paragraph 1 on page 3 of 14, Section 1.1.2, states that samples will be analyzed for pesticides and PCBs among other analytes; and Table 5 of Appendix A includes pesticides and PCBs as a laboratory parameter. In addition, Section 1.1.1 includes TSCA rules for PCBs as an example of pertinent federal regulatory criteria, and Section 1.3.1 discusses a TSCA closure cell located at the site. Lastly, Appendix A includes an analytical method for pesticides and PCBs. Therefore, this section should include pesticides and PCBs as laboratory parameters or their omission should be explained.

25. **Section 1.4.3, Page 13 of 14, Paragraph 1**. This section states that analytical data quality level 3 will be used for this project. As stated during the pre-QAPP meeting in January 1995, all references to data quality objective (DQO) levels should be deleted because EPA has determined that they are no longer relevant.

    This paragraph also states that the main purpose of data collection is to determine the existence of contamination that remains from past releases on site. However, Section 1.4.1 states that a confirmational level of data quality is needed for the purpose of risk assessment, evaluation of remedial alternatives, and establishment of cleanup levels. The last statement is more consistent with the purpose of the RFI stated in Section 1.1.1. All references to analytical data quality and data purposes should be revised to be consistent.

26. **Section 1.5.2, Page 13 of 14, Paragraph 4**. This paragraph states that some of the proposed sampling locations could be changed depending on the nature of encountered field conditions. The text should be revised to provide examples of such conditions.

27. **Section 1.6.1, Page 14 of 14, Paragraph 2**. This paragraph provides dates during which field activities are scheduled to begin. The text should reflect that the beginning of field activities is contingent upon EPA approval of the RFI workplan. This section also refers to a task bar chart that was submitted with the QAPP; however, this figure was not included in the QAPP. This figure should be provided.

28. **Section 2.1, Page 1 of 7, Paragraph 2**. This paragraph refers to an organization chart that is "in Section 5.0 of Figure 7-1 of the RFI Workplan"; however, this figure was not included in Section 5.0 or any other section of the RFI. An organization chart that includes the names of and lines of authority between key project personnel should be included in Section 2.1 of the revised QAPP.

29. **Section 2.2, Page 1 of 7, Paragraph 4.** This section states that the CWM-Vickery project manager will report directly to the EPA Region 5 RCRA Permit Writer (RPW)/RCRA Project Coordinator (RPC)/State Project Manager. This text is taken verbatim from the Model QAPP. If the CWM-Vickery manager will not be reporting to the state project manager, therefore, reference to the state project manager should be deleted.

30. **Section 2.4, Page 3 of 4.** An address of the laboratory, where the RFI samples will be sent, shall be provided.

31. **Section 2.4, Page 4 of 7, Paragraph 2, Bullet 4.** This bullet states that the CWM Riverdale National Laboratory QA officer will determine whether to implement laboratory corrective actions. The text should clarify whether the QA officer is also responsible for formally approving corrective actions.

32. **Section 2.4, Page 4 of 7, Paragraph 2, Bullet 7.** This bullet states that the laboratory's QA officer is responsible for signing the title page of the QAPP. Signing the title page indicates that the signee approves of the QAPP; therefore, the text should also mention that the laboratory QA officer is responsible for approving the QAPP.

33. **Section 2.5, Page 6 of 7, Paragraph 1; and Page 7 of 7, Paragraph 1.** These paragraphs discuss the responsibilities of the on-site laboratory manager and lab staff. The headings to these paragraphs end with the phrase "[if applicable]" as shown in the Model QAPP. It should already be established whether an on-site laboratory will be used. Based on the laboratory parameters to be analyzed for, it does not seem likely that an on-site laboratory will be used. If this is the case, then these paragraphs should be deleted along with the reference to field laboratory staff in the first bullet at the top of page 6 of 7. If, however, an on-site laboratory will be used, the phrase "[if applicable]" should be deleted from the headings to these paragraphs and the text should state the laboratory parameters that will be analyzed for at the on-site laboratory.

34. **Section 3.0.** This section, which discusses QA objectives, does not provide a project-specific description of QA objectives. As noted in the general comments, this section also contains extensive generic text from the Model QAPP. In addition, QA objectives for sediment samples are not discussed in Section 3.0. This section should provide QA objectives for all project-specific field and laboratory target parameters and sample matrices.

35. **Section 3.1.2, Page 1 of 5, Paragraph 3.** This paragraph states that field duplicates will be collected at a frequency of one duplicate per 10 analytical samples. However, the FSP states that the frequency of collecting field duplicates will be one for every 20 analytical samples. This discrepancy should be resolved and the text should be revised accordingly.

36. **Section 3.1.2, Page 1 of 5, Paragraph 3; and Section 3.2.2, Page 2 of 5, Paragraph 2.** These sections discuss field precision and accuracy through the collection and measurement of QA/QC samples to be analyzed in the laboratory. These sections should also discuss the assessment of precision and accuracy for field screening instruments, such as the PID.

37. **Section 3.1.3, Page 1 of 5, Paragraph 4.** This paragraph states verbatim from the Model QAPP that precision in the laboratory will be assessed through the calculation of relative percent difference (RPD) and relative standard deviation (RSD) for three or more replicate samples. The text should state the specific laboratory parameters for which RPD will be used and for which RSD will be used to assess precision. If RSD is not being used, then the number of replicate samples should be changed from three or more to two because RPD requires only two replicate samples.

38. **Section 3.1.3, Page 1 of 5, Paragraph 4; and Section 3.2.3, Page 2 of 5, Paragraph 3.** These paragraphs state that precision and accuracy control limits are provided in Appendix A. However, Appendix A contains only general information on precision and accuracy control limits in the form of photocopied pages from SW-846. Project-specific precision and accuracy control limits for each target analyte should be clearly identified in these sections.

39. **Section 3.2.2, Page 2 of 5, Paragraph 3.** This paragraph states that accuracy in the field is assessed through the use of field and trip blanks. These blanks are aqueous samples that are not typically used to assess accuracy of soil sample collection due to the incomparability of the different matrices. This discussion of field and trip blanks should either be deleted or their applicability to soil samples should be explained. If deleted, the discussion of field and trip blanks in Section 3.6 should also be deleted.

40. **Section 3.2.3.** This section states that laboratory accuracy will be assessed through analysis of matrix spike (MS) samples or standard reference materials (SRM). The QAPP should specify which analyses will use MSs and which analyses will use SRMs.

41. **Section 3.3.** This section defines both field and laboratory completeness as "the number of valid measurements obtained from all measurements taken during the project." This definition is incorrect in both instances and should be revised to state that field and laboratory completeness is the number of valid measurements obtained from all measurements planned to be taken in the field and laboratory, respectively.

42. **Section 3.3.2, Page 2 of 5, Paragraph 5.** This section states that field completeness is the amount of valid measurements obtained from all measurements taken in the project and refers to a formula for completeness that is presented in Section 12 of the QAPP. The numerator of this formula represents the "number of valid measurements." The text should explain what criteria will be used to determine the validity of a field measurement.

43. **Sections 3.3.2 and 3.3.3, Pages 2 and 3 of 5.** These sections provide total field and laboratory completeness objectives of 90 and 95 percent, respectively. This approach could result in incomplete data for a particular SWMU or AOC. Therefore, individual completeness objectives should be established for each SWMU and AOC. Also, a sufficient number of samples should be collected to make completeness a meaningful parameter. For example, for SWMU Group E, the FSP indicates that a total of three samples will be collected. If only two of the three sample results were valid, the completeness would be only 67 percent, and the objective would not be met. Therefore, the completeness objective should be modified, or the number of samples to be collected should be increased. The QAPP should be revised to reflect this requirement.

44. **Section 3.4.3, Page 3 of 5, Paragraph 3, Lines 1 and 2.** These lines state that representativeness in the laboratory will be ensured by analyzing and assessing field duplicate samples. The QAPP should explain how analytical results for field duplicates, which are generally used to assess the combined precision of sampling and analyses, can be used to assess the representativeness of data generated in the laboratory.

45. **Section 3.6, Page 5 of 5, Paragraph 3.** This paragraph states that the numbers of duplicate and field blank samples to be collected are listed in the FSP. However, the numbers of these samples to be collected are not listed in the FSP. The FSP does not discuss field blanks and only provides the sampling frequency for field duplicates. The QAPP and the FSP should be revised so these documents are consistent and the numbers of duplicate and field blank samples are clearly presented. Also, will aqueous VOA samples be collected?

46. **Section 4.0.** This section lists in bulleted format the types of information that can be found in the FSP. In accordance with the Model QAPP, each bullet should provide the subsection of the FSP where the information can be found.

47. **Section 4.0, Page 1 of 1, Bullet 2.** This bullet indicates that obtaining contaminant-free sample containers is discussed in the FSP. However, the discussion in the FSP lacks specific information required by the Model QAPP. The FSP should include the following information: detailed procedures used to prepare contaminant-free sample containers, the criteria that the containers must meet, how the criteria are verified, and the frequency of verification.

48. **Section 4.0, Page 1 of 1, Bullet 8.** This bullet indicates that sampling equipment decontamination procedures are discussed in the FSP. However, the only discussion of decontamination in the FSP pertains to the decontamination area and does not adequately address procedures to be used to decontaminate sampling equipment. The text should be revised to discuss the procedures for decontaminating sampling equipment.

49. **Section 4.0, Page 1 of 1, Bullets 12 and 13.** These bullets indicate that the FSP discusses the soil sampling order and the sediment sampling order. The Model QAPP explains that the sampling order is the order of "analytical

parameter sample fraction collection." The FSP states that only sample fractions will typically be collected from the most sensitive to least sensitive parameters. The FSP should state the order in which samples for specific analytes will be collected.

50. **Section 5.1, Page 2 of 5, Paragraph 4**. This paragraph discusses field custody procedures and refers to a chain-of-custody record and a chain-of-custody form. The text should reference Figure 5-1 of the FSP, which shows a chain-of-custody record form.

51. **Section 5.1, Page 3 of 5, Item e, Lines 1 and 2**. The text states that samples will be dispatched to the appropriate laboratory for analysis. This statement should be clarified by identifying CWM Riverdale National Laboratory as the appropriate laboratory.

52. **Section 5.1, Page 3 of 5, Item e, Lines 5 and 6**. These lines state that custody seals will be attached to the cooler. These lines should also state that the field team leader or a designee will sign the custody seals before they are attached to the cooler.

53. **Section 5.2, Page 4 of 5, Paragraph 1**. This paragraph states that laboratory custody procedures are provided in CWM Riverdale National Laboratory procedures (in Appendix A) and in following sections, but they are only provided in Appendix A. The reference to following sections should be deleted from the text.

54. **Section 5.3, Page 4 of 5, Paragraph 2**. This paragraph discusses the final evidence files, but does not specify the length of time during which files will be maintained. According to the Model QAPP, the length of time during which the files will be maintained should be specified in this section. It should also be stated that the file will be offered to the U.S. EPA prior to its disposal.

55. **Section 6.0**. This section, which discusses calibration procedures, should include a table similar to Table 6 in the Model QAPP. The table should summarize calibration standards and frequency, acceptance criteria, and corrective actions for each field and laboratory measurement and for each sample matrix.

56. **Section 6.2, Page 2 of 2, Paragraph 1**. For calibration procedures and analytical methods, this paragraph refers to "method Nos. 92-02, 8080A, 8150A, 8270A, 8260 for organic compounds analysis and method Nos. 6010A, 7740, 7060A, 7471A, 7841, 7421 for metals analysis." The following comments pertain to this statement.

    - Except for CWM method 92-02, these methods are all SW-846 methods. According to the Model QAPP, laboratory-specific SOPs are required for all analyses and should be included in the appendixes to the QAPP (see general comment 7). This section should reference these SOPs and discuss any deviations from the SOPs that may occur during the CWM-Vickery RFI.

- Any references to EPA SW-846 methods should be clearly identified as such to differentiate them from CWM methods and SOPs.

- The text should present the laboratory parameters analyzed for by each SOP and corresponding EPA methods.

- EPA SW-846 methods 8150A, 8270A, and 8260 have been updated to methods 8150B, 8270B, and 8260A, respectively, in SW-846 Update II promulgated in September 1994. Wherever appropriate, these updated methods should be referred to in this QAPP and employed by the CWM Riverdale National Laboratory.

57. **Section 7.0**. This section is deficient because it lacks project-specific information specified in the Model QAPP, for both field and laboratory concerns. The following comments and the bulleted comments in specific comment 60 apply to Section 7.0:

    - The text of this section should state all analytical parameters; the corresponding laboratory-specific SOPs for sample preparation, sample analyses, and confirmatory analysis (if applicable); and the approved EPA methods upon which the SOPs are based. This information should be summarized in tables similar to the example tables provided in Section 7 of the Model QAPP.

    - The text should provide a brief explanation of how the method detection limit study, was conducted, and should reference a QAPP appendix for documentation of the study.

58. **Section 8.0**. To clarify the proposed QC program, this section, which discusses internal QC checks, should include a table summarizing the types, frequencies, acceptance criteria, and corrective actions associated with all QC checks for each analysis and sample matrix.

59. **Section 8.1, Page 2 of 2, Paragraph 0**. This paragraph states that any samples that are analyzed and are found to be in nonconformance with the QC criteria will be reanalyzed by the laboratory if sufficient volume is available. The text should also state that reanalysis will occur if sample holding times are not exceeded.

60. **Section 9.1, Page 1 of 5, Paragraph 2**. This paragraph refers to results forms for field data; however, examples of these forms are not provided. Examples of these forms should be included in the revised QAPP or the FSP.

    This paragraph states that the field manager is identified "in Section 5.0 of the RFI Workplan at Figure 7-1." However, this figure was not found and the field manager was not identified in the RFI workplan. This individual should be identified and the missing figure should be provided. In addition, a field team leader is discussed in Section 2, but a field manager is not discussed. If these positions refer to the same job title, consistent terms should be used in Sections 2.0 and 9.0. If these job

titles represent different individuals, then the field manager's responsibilities should either be discussed in Section 2.0 or not be included in Figure 7-1.

61. **Section 9.1.1, Page 1 of 5, Paragraph 2**. This paragraph states verbatim from the Model QAPP that a mobile gas chromatograph (GC) will not be used until a later phase of the study. The potential Phase II activities highlighted in Section 1.1.2 do not specifically reference a mobile GC. Only if it is an intent to address Phase II of the RFI under scope of this QAPP, the purpose of the mobile GC should be clearly stated in the revised QAPP. If this is not the case, the reference to the GC should be deleted from this section.

62. **Section 9.2.1, Page 2 of 5**. This section discusses procedures used to evaluate field data; however, checking calibration of the PID used to generate field data and the quantity of field data that will be evaluated are not addressed. This section should discuss checking PID calibration and performing other QC checks as part of field data validation. This section should also state that 100 percent of the field data will be validated.

63. **Section 9.2.2, Page 3 of 5, Paragraph 1**. This paragraph references EPA guidelines for reviewing organic data. The review and validation of inorganic data should also be addressed because metals were identified as laboratory parameters in Section 1.4.2.2. This paragraph also states that the results of all QC checks for VOCs shall be validated by the data validator. The name of individuals performing data validation should be identified.

64. **Section 9.3.1, Page 3 of 5**. This section refers to report sheets for field data reporting. Examples of these report sheets should be included in the QAPP or FSP.

65. **Section 10.1.1.1, Page 1 of 3, Paragraph 2**. This paragraph states that the QA officer will perform internal field audits. The text should identify whether the individual referred to is the CWM-Vickery QA Officer or the Rust QA Officer.

66. **Section 10.1.1.3, Page 1 of 3**. This section, which discusses internal field audit procedures, should specify that EPA will be notified immediately of all nonconformances with the QAPP and FSP that affect data quality and that such notifications will be made before corrective actions are implemented.

67. **Section 10.1.1.3, Page 2 of 3, Paragraph 0**. This paragraph states that the field audit checklist for this project is submitted with the QAPP; however, this checklist was not found in the QAPP. This checklist should be submitted and the text should be revised to state its location in the QAPP.

68. **Section 10.2.1.2, Page 2 of 3**. This section, which discusses the frequency of internal laboratory audits, states that system and performance audits will be performed on an annual and quarterly basis, respectively. It would be advisable for CWM to perform both system and performance audits at the beginning of the Phase I RFI to ensure that any problems are identified and

corrected early in the project. The revised QAPP should state that system and performance audits will be conducted during the first month of the RFI.

69. **Section 10.2.1.3, Page 3 of 3, Paragraph 1**. This paragraph states that the laboratory audit checklist for this project was submitted with the QAPP, but it was not found in the QAPP. This checklist should be submitted and the text should be revised to state its location in the QAPP.

70. **Section 11.2, Page 1 of 1, Paragraph 2**. This paragraph discusses laboratory instrument preventive maintenance. Tables similar to Tables 7 and 8 in the Model QAPP should be provided to summarize the maintenance requirements and frequencies for key analytical instruments or equipment. These tables should also be referenced in this section.

71. **Section 12.0**. Sections 3.1.2 and 3.2.3 refer to this section for equations that will be used to calculate precision in terms of RSD and accuracy using SRM, respectively. However, the equations for these calculations are not provided in this section. If RSD and SRMs will be used to evaluate data for this project, then the equations that will be used to calculate RSD and accuracy using SRMs should be provided.

72. **Section 12.2, Page 1 of 2, Paragraph 2**. This paragraph states that spiked samples will be prepared by choosing a sample at random from each sample shipment received at the laboratory. However, Section 3.6 states that MS/MSDs will be designated and collected in the field. Therefore, the text should be revised to consistently state that samples to be spiked will be designated in the field.

73. **Section 13.3, Page 3 of 3, Paragraph 5**. This paragraph refers to the Rust data assessor, who is not identified in this section or in Sections 2.0 or 9.2.2. The text should be revised to identify this individual.

74. **Section 14.1, Page 1 of 2, Paragraph 3**. This paragraph states that QA reports can be made by telephone to the appropriate individuals when corrective action needs to be implemented immediately. The text should also state that the EPA RPW/RPC will be one of the individuals who is notified.

75. **Section 14.3, Page 2 of 2, Paragraph 5**. This paragraph refers to a project organization chart that was not provided (see specific comment 29). A project organization chart should be provided.

The following specific deficiencies pertain to Appendix A:

76. The pages of the appendix are not in proper sequence. All pages of the appendix should be numbered and thoroughly checked to ensure that they are in the correct order upon submittal.

77. Appendix A contains several SOPs that do not apply to this project such as SSP No. 100-14 titled "Site Specific Practice for TC-86-02 Solvent Method for Incineration," and SSP No. 100-7 titled "Appendix 1 Site Specific Screen for TC-86-02 Solvent Screen." In addition, a photocopy of SW 846 Method 8150A for herbicide analyses is included, yet the QAPP does not identify

herbicides as an analytical parameter. Appendix A should be thoroughly checked and all extraneous SOPs should be deleted.

78. Appendix A contains photocopies of SW 846 Method 6010A for metals analysis and photocopies of some 7000 Series Methods for thallium, arsenic, selenium, and lead. Because Methods 6010A and 7000 Series Methods are both applicable to these four metals, the QAPP must distinguish between when Methods 6010A and when 7000 Series Methods will be used.

79. SSP No. 92-02 titled "Solvents Analysis Using Gas Chromatography" does not identify detection limits, QC acceptance criteria, calibration acceptance criteria, and corrective action. In addition, Section 7.5 of this SSP states that a single point calibration will be used. However, Section 6.2 of the QAPP states that calibrations will consist of 3 to 5 points. This SSP should be revised to include the above information and to reflect the use of 3 to 5 point calibration procedures.

80. An SOP should be proposed for endrin ketone, which is a target compound listed in Table 1. (Note that although SW-846 method 8270 does not include this compound on its target list, it happens to be included on the method 8270A (Final Update 1 to SW-846) target list.)

81. The following compounds were spelled incorrectly in Table 2 of the QAPP: 1,3 dichlorobenzene; 2,4 dimethylphenol, acenaphthylene, 4-chlorophenylphenyl ether, pentachlorophenol, fluoranthene. Corrections should be made.

82. Table 5 in Appendix A summarizes the sampling and analysis program; however, this table does not include the sampling and analysis to be conducted at AOCs described in the FSP. AOC sampling and analysis requirements should be added to Table 5.

83. The first column of Table 5 has the heading "SWMU," but the sampling and analysis activities summarized in the table pertain to SWMU groups. After AOCs are added to the table, the heading for the first column should be changed to "SWMU Groups and AOCs." The sixth and seventh columns have the headings "matrix duplicate" and "matrix spike," respectively; however, Section 3.6 of the QAPP uses the term "field duplicates" and also states that matrix spikes will be referred to as "MS/MSD samples" because they are collected in duplicate. These column headings should be changed to correspond to the terminology used in Section 3.6.

84. In the field parameter column of Table 5, "qualitative screening with photoionization detector," is listed as the field parameter for all SWMU groups; however, this does not state a field parameter. The entries in this column should be revised to also state that the PID measures organic vapors.

85. Table 5, which is subheaded "Field QA/QC Samples," indicates that samples in addition to investigative samples are required for "matrix spike" samples. However, Section 3.6 of the QAPP states that soil MS/MSD samples require no extra sample volume for VOCs or extractable organics, and Sections 12.1 and

12.2 state that spike samples are selected from sample shipments at the laboratory. If the table is to include only field samples, then either the "matrix spike" samples should be deleted from the table, or the text in Sections 3.6, 12.1, and 12.2 should be revised accordingly. If the table is to include QA/QC samples both collected in the field and prepared in the laboratory, then the table subheading should be revised to read "QA/QC Samples" and the samples listed in the table should be clearly identified as to whether they are collected in the field or prepared in the laboratory.

86. According to Table 5, the number of "matrix duplicate" and "matrix spike" samples to be collected for metals is greater than the number required for other laboratory parameters. However, Section 3.6 provides only one sampling frequency for field duplicates (1 every 10 investigative samples) and one sampling frequency for MS/MSD samples (1 every 20 investigative samples) for all laboratory parameters. Therefore, in Table 5, the number of "matrix duplicate" samples should be the same for all laboratory parameters, as should the number of "matrix spike" samples; otherwise, the text should discuss the reasons for proposing different QA/QC sampling frequencies for the different laboratory parameters. Table 5 also indicates that "matrix duplicate" and "matrix spike" samples have the same sampling frequency; however, these two distinct types of QA/QC samples have different sampling frequencies according to Section 3.6. The numbers in Table 5 should be consistent with the text in Section 3.6. It should also be noted that for a QA/QC sampling frequency of 1 every 10 investigative samples, a QA/QC sample should be collected for every 10 or fewer investigative samples which requires rounding-up the number of QA/QC samples for the remaining fraction of 10 investigative samples. For example, the 32 investigative samples to be collected at SWMU Group A require four, not three, matrix duplicate samples.

87. Table 5 provides four different values for the number of QA/QC samples to be collected for the four groups of laboratory parameters, but provides only one value for the number of investigative samples to be collected for each SWMU group. Table 5 should present a consistent approach for both investigative and QA/QC samples as to whether one sample will be considered to include the total sample volume for all four laboratory parameter groups or whether these will be considered four distinct samples.

88. Table 5 lists 25 as the number of investigative samples to be collected for SWMU Group C; however, the FSP states that 26 samples will be collected for this SWMU group. This discrepancy should be resolved.

89. Table 5 states that trip, field, and "rinse" blanks are to be collected. "Rinsate" blanks, which are described in the FSP, are also aqueous samples. As previously stated in specific comment 43, aqueous trip and field blanks are typically not required for soil samples. Therefore, these samples should be deleted from Table 5. If, however, these

samples are required due to atypical circumstances, these circumstances should be explained in the text and rinsate blanks should be added to the discussion of QA/QC samples in Section 3.6. Table 5 should also clearly identify the number of each type of blank to be collected instead of only showing the total of all three types of blanks.

90. Apparently, no SOP was provided for the analysis of cyanide. SOPs should be presented for each site specific target parameter.

END OF QAPP COMMENTS

EPA PARTICIPANTS 12/1/94

Name	Organization	Phone
Allen Debus	RPB – QAPP Coordinator	(312) 886-6186
CHENG-WEN TSAI	QAS	(312) 886-6234
Chuck Maurice	RPB	312-886-6635
THOMAS MATHESON	RPB	(312) 886-7569
David Payne	QASS, MQAB	(312) 353-2313

Pre-QAPP
Scoping meeting
for Clean Water

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

MEMORANDUM

SQ-14J

DATE: FEB 5 1993

SUBJECT: Final Approval of the Revised Quality Assurance Project Plan (QAPjP) Addendum to the Groundwater Monitoring Plan for the Chemical Waste Management (Vickery, Ohio) U.I.C. Facility

FROM: Curtis Ross
Acting Regional Quality Assurance Manager

TO: Ed Watters, Chief
Safe Drinking Water Branch

ATTENTION: Nathan Wiser, Project Coordinator

I am providing final approval for the subject revised QAPjP (QAS Log-In # W058) recieved on February 1, 1993. The QAPjP was conditionally approved in my memorandum dated January 13, 1993. All conditions specified in the memorandum have been met.

In lieu of a signature page, this memo will serve to document my final approval.

If you should have any questions, please contact Kevin Bolger of my staff at 3-7712.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

MEMORANDUM

REPLY TO THE ATTENTION OF:
SQ-14J

DATE: JAN 13 1993

SUBJECT: Conditional Approval of the Revision 2 Quality Assurance Project Plan (QAPjP) Addendum to the Groundwater Monitoring Plan for the Chemical Waste Management (Vickery, Ohio) U.I.C. Facility

FROM: Curtis Ross
Acting Regional Quality Assurance Manager

TO: Ed Watters, Chief
Safe Drinking Water Branch

ATTENTION: Nathan Wiser, Project Coordinator

I am providing conditional approval for the subject revised QAPjP (QAS WD Log-In # 024) received in three partial submissions on November 30 and December 11, 1992 and January 13, 1993.

The conditions for final approval are two-fold:

- All GC analyses (i.e. organophosphorous pesticides, phenoxyacid herbicides, organochlorine pesticides/PCBs) using 2 dissimiliar columns shall report the quantitative results for each column for all investigative samples, blanks, matrix spikes, surrogate recoveries, etc. The % difference between the results for each column shall be calculated and presented.

- The reporting limit for GC/MS analysis of semivolatile organics shall be raised from 10ppB to 20ppB since 20ppB is the lowest point in the calibration curve.

These conditions may be satisfied through expeditious submission of revised pages for the applicable ENSECO procedures. The Quality Assurance Section (QAS) will be able to provide final review of these pages after the facility submits them to the USEPA U.I.C. Project Coordinator.

A signature page indicating the conditional approval is attached to this memorandum. Please forward a fully completed copy within the next two weeks to the QAS (Mailcode = SQ-14J, Attention: Kevin Bolger). If you should have any questions, please contact Kevin Bolger of my staff at 3-7712.

Attachment: Signature Page

I. TITLE PAGE AND QAPjP APPROVAL

QUALITY ASSURANCE PROJECT PLAN
FOR
CHEMICAL WASTE MANAGEMENT, INC
VICKERY, OHIO

ADDENDUM TO THE
GROUND WATER MONITORING PLAN

APPROVALS

USEPA Region V Project Coordinator

_____ Date _____

USEPA Region V Quality Assurance Officer

* _____ Date 1/13/93

OEPA Project Coordinator

_____ Date _____

Chemical Waste Management, Inc., Project Manager

_____ Date _____

Texas World Operations, Inc., Project Manager

_____ Date _____

WMI Environmental Monitoring Laboratories, Inc., President

_____ Date _____

Enseco Incorporated, Quality Assurance Officer

_____ Date _____

QuantaLex Incorporated, Technical Operations Manager

_____ Date _____

* Conditional Approval – conditions outlined in attached memorandum must be satisfied for full approval

ATTACHMENT

QUALITY ASSURANCE PROJECT PLAN

I. TABLE OF CONTENT

A. Please include the page number for all sections and subsections.

II. PROJECT DESCRIPTION

A. In Section 4.3 (Intended Data Usage), please address the usage of data from field measurements that are specified in Table III-1.

B. In Section 5.0 (Target Parameters), please address the following:

1. A parameter list including the required method detection limits should be included in this section.

2. Appendix IX parameters are specified to be tested for certain samples. It is not clear, however, whether it means the whole Appendix IX parameter list or only part of the list. Please clarify it accordingly.

3. In page 12 of 22, please address the following:

   a. "trans-1,2-Dichloroethene" should be changed to "1,2-Dichloroethene (Total)".

   b. "1,3-Dichloropropene" should be changed to "trans-1,3-Dichloro-propene" and "cis-1,3-Dichloropropene".

4. In page 13 of 22, please address the following:

   a. Samples for inorganics should not be field filtered.

   b. "Dissolved metal" should be changed to "Total metal".

   c. Please clarify whether "alkalinity" and "total dissolved carbonate" are both needed. Please clarify it and make any necesary changes in page 13 and 14 of 22.

   d. In page 14, 15 of 22, it is not clear whether the whole Appendix IX paameters will be tested for all rounds of samples. If the answer is "No", then we suggest that it should be done for the first round of samples. The number of Appendix IX parameters to be tested can be reduced only after

Texas World
Operations, Inc.

January 28, 1993

VIA: FEDERAL EXPRESS
AIRBILL NO. 6168713902

Mr. Nathan Wiser WD-17J
United States Environmental Protection Agency - Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Addendums to CWM-Vickery QAPjP, based on 1/13/93 EPA conditional approval.

Dear Mr. Wiser:

At the request of Mr. Steve Lonneman, please find enclosed two (2) sets of addendum pages to be placed at the front of appropriate QAPjP appendices. This material replaces previous addendum pages. New addendums are included for Appendices B-9, B-10, B-11 and B-12.

With this transmittal of data, all known regulatory agency requests for revisions, clarifications and additions to the QAPjP have been provided.

Please call me at (713) 850-0003 if you have any questions or comments.

Sincerely,

TEXAS WORLD OPERATIONS, INC.

James Sandt

James E. Sandt
Geologist

HW058

CWMGWMP\QAPP592\ADD1-28.CVL

Additional Distribution:

Mr. Steve Lonneman Chemical Waste Management, Inc. 3965 State Route 412 Vickery, Ohio 43464	cc letter Two (2) data sets Airbill No. 6168713891
Ms. Mary Lou Hodnett Ohio Environmental Protection Agency 1800 Watermark Drive Columbus, Ohio 43266	cc letter One (1) data set Airbill No. 6168713880
Ms. Marti Pruhs WMI- Environmental Monitoring Laboratories, Inc. 2100 Cleanwater Drive Geneva, IL 60134	cc letter One (1) data set Airbill No. 6168713876
Ms. Maureen McDevitt Enseco - Rocky Mountain Analytical 4955 Yarrow Street Arvada, Colorado 80002	cc letter One (1) data set Airbill No. 6168713865
Mr. Robert Thielke QuantaLex Inc. 300 Union Boulevard, Suite 600 Lakewood, Colorado 80228	cc letter One (1) data set Airbill No. 6168713854
Ms. Sheryl Silberman Texas World Operations 520 Post Oak Boulevard, Suite 450 Houston, Texas 77027	cc letter No data

ADDENDUM TO CWM Vickery GWMP QAPjP Appendix B-9
SOP Number: LM-RMA-4007
Title: Phenoxyacid Herbicides
by Electron Capture Gas Chromatography

This addendum is specific to the Chemical Waste Management, Vickery, Ground Water Monitoring Plan QAPjP. Procedural changes or clarification statements presented herein are not applicable to Enseco SOPs for other projects, and are made here in response to EPA letters dated March 17, 1992, September 15, 1992 and January 13, 1993 to CWM containing comments (with additional attachments) regarding the CWM-Vickery GWMP QAPjP.

Section 1.1: Target compounds are listed in this section. Parameter retention time is variable with instrument condition and may vary slightly from calibration to calibration. A parameter list with relative retention times is provided following this addendum. Retention times recorded for an actual calibration are found in QAPjP Appendix B-9A.

Section 1.3: Linear dynamic range of compounds is determined from the instrument calibration, and normally covers one order of magnitude of analyte concentration. Herbicide target compound linear ranges are presented in a table at the front of QAPjP Appendix B-9A.

Section 6.2: Enseco-RMAL performs GC-ECD analyses using two dissimilar columns in order to accurately identify and quantitate organic compounds. Both columns are individually calibrated and must conform to constraints of ±20% difference for all compounds. When a compound is detected on both columns, the quantitative result is generally chosen from the lower of the two determinations. The higher value can reflect contamination from co-eluters, so the result is generally biased high. Based on this convention, Enseco-RMAL cannot designate one column as the primary column. Since quantitative data is taken from both columns throughout an analysis, both columns are, in a sense, equal to each other during the analysis.

For this specific project only, Enseco will report the quantitative results from each column for all investigative samples, blanks, matrix spikes, surrogate recoveries etc.. The RPD between the results for each column shall be calculated and presented.

Section 13.: See QAPjP Appendices C-3 and G for an example of the data reporting package.

Standards Preparation:

QAPjP Appendix B9-B contains four SOPs for the preparation of various standards utilized for herbicides analyses.

SOP Number: LM-RMA-4006
Title: Organophosphorous Pesticides
by Flame Photometric Gas Chromatography

This addendum is specific to the Chemical Waste Management, Vickery, Ground Water Monitoring Plan QAPjP. Procedural changes or clarification statements presented herein are not applicable to Enseco SOPs for other projects, and are made here in response to EPA letters dated March 17, 1992, September 15, 1992 and January 13, 1993 to CWM containing comments (with additional attachments) regarding the CWM-Vickery GWMP QAPjP.

Section 6.18: Enseco-RMAL performs GC analyses using two dissimilar columns in order to accurately identify and quantitate organic compounds. Both columns are individually calibrated and must conform to constraints of ±20% difference for all compounds. When a compound is detected on both columns, the quantitative result is generally chosen from the lower of the two determinations. The higher value can reflect contamination from co-eluters, so the result is generally biased high. Based on this convention, Enseco-RMAL cannot designate one column as the primary column. Since quantitative data is taken from both columns throughout an analysis, both columns are, in a sense, equal to each other during the analysis.

For this specific project only, Enseco will report the quantitative results from each column for all investigative samples, blanks, matrix spikes, surrogate recoveries etc.. The RPD between the results for each column shall be calculated and presented.

Section 7.: Additional data requested by USEPA on Reagents and Standards is not routinely provided with analytical results. This information is available for review by regulatory agencies during external audits. A description of the materials provided in raw data packages (provided on client request) is found in QAPjP Appendix B-10A. QAPjP Appendix B-10C contains SOPs for the preparation of initial and continuing calibration standards,surrogates and matrix spikes.

Section 8.2.4 and 8.2.5: The requested information on surrogate and matrix spiking solutions is normally contained on the preparation sheets, which are located within a raw data package. QAPjP Appendix B-10C contains SOPs for the preparation of initial and continuing calibration standards, surrogates and matrix spikes.

Section 10: Linear dynamic range of compounds is determined from the instrument calibration, and normally covers one order of magnitude of analyte concentration. See QAPjP Appendix B-10B for an example of a five point instrument calibration. OPP target compound linear ranges are presented in a table at the front of QAPjP Appendix B-10B.

Continuing calibration checks are performed every 10 investigative samples. Check standards are referenced in the SOP in Section 9.1, under calibration.

Section 10.1.2: Matrix spike and matrix spike duplicate analysis are performed at a frequency of one per every group of 20 investigative samples.

Section 11.4: See QAPjP Appendices C-3 and G for an example of the data reporting package, and QAPjP Appendix B-10A for raw data package content according to package type. Long form packages will be used.

Parameter retention time is variable with instrument condition and may vary slightly from calibration to calibration. Target parameters and relative retention times are provided in a table following this addendum page. Retention times recorded for an actual calibration are found in QAPjP Appendix B-10B.

ADDENDUM TO CWM Vickery GWMP QAPjP Appendix B-11
SOP Number: LM-RMA-4003
Title: Organochlorine Pesticides and PCBs

This addendum is specific to the Chemical Waste Management, Vickery, Ground Water Monitoring Plan QAPjP. Procedural changes or clarification statements presented herein are not applicable to Enseco SOPs for other projects, and are made here in response to EPA letters dated March 17, 1992, September 15, 1992 and January 13, 1993 to CWM containing comments (with additional attachments) regarding the CWM-Vickery GWMP QAPjP.

Section 2.1

Enseco-RMAL performs GC analyses using two dissimilar columns in order to accurately identify and quantitate organic compounds. Both columns are individually calibrated and must conform to constraints of ±20% difference for all compounds. When a compound is detected on both columns, the quantitative result is generally chosen from the lower of the two determinations. The higher value can reflect contamination from co-eluters, so the result is generally biased high. Based on this convention, Enseco-RMAL cannot designate one column as the primary column. Since quantitative data is taken from both columns throughout an analysis, both columns are, in a sense, equal to each other during the analysis.

For this specific project only, Enseco will report the quantitative results from each column for all investigative samples, blanks, matrix spikes, surrogate recoveries etc.. The RPD between the results for each column shall be calculated and presented.

Section 2.2:

Please refer to QAPjP Section IX for the list of project target compounds and QAPjP Appendix C-1 for the project specific quantitation limits.

Section 7.:

Please refer to Section 9.1 of this SOP for additional data on instrument calibration standards and methods. QAPjP Appendix B-11A contains an example of a five point instrument calibration. OCP/PCB target compound linear ranges are presented in a table at the front of QAPjP Appendix B-11A.

Section 8.2.4 and 8.2.5: Please see comment for Section 10.1, below.

Sample Cleanups: GPC and /or Acid cleanups will not be performed for this project since only aqueous samples will be analyzed.

Section 10.1: Matrix spike and matrix spike duplicate analysis are performed at a frequency of one per every group of 20 investigative samples. The compounds and concentrations used are the same as shown for duplicate control samples on pages 27 and 28 of the SOP.

Relative Retention Time:

Parameter retention time is variable with instrument condition and may vary slightly from calibration to calibration. Relative parameter retention times are presented in a table at the front of QAPjP Appendix B-11, immediately following this addendum page. Retention times recorded for an actual calibration are found in QAPjP Appendix B-11A.

Standard Preparation:

Standard preparation SOPs are located in QAPjP Appendix B-11B.

SOP Number: LM-RMA-3013 BNA 625
Title: GC/MS Analysis of Semivolatile Organics

This addendum is specific to the Chemical Waste Management, Vickery, Ground Water Monitoring Plan QAPjP. Procedural changes or clarification statements presented herein are not applicable to Enseco SOPs for other projects, and are made here in response to EPA letters dated March 17, 1992, September 15, 1992 and January 13, 1993 to CWM containing comments (with additional attachments) regarding the CWM-Vickery GWMP QAPjP.

Section 1.2: Dilutions of samples are performed within accepted EPA guidelines in SW-846 and the CLP methods. All samples are screened prior to analysis. The screening results are used to optimize the sample analysis to achieve the lowest possible reporting limits. Dilutions are only performed relative to compounds that would interfere with the analysis. Thus, a high concentration of inorganic ions such as sodium would not result in a dilution being performed for semivolatile organics. Only those compounds that have the property of a "semivolatile organic" would cause a dilution.

Section 2.2: "Solid" samples will not be analyzed within the scope of this project. For the purposes of this project specific QAPjP, Section 2.2 of this SOP is deleted.

Sections 7.6 to 7.10: Appendix B, containing the referenced standard solutions is contained within the SOP. See pages 55 through 59 of 64 for the appropriate information.

Section 8.2.1 Enseco-RMA plans to use CLLE (continuous liquid-liquid extraction) for all GC/MS semi-volatile analyses.

Section 8.8.2: Initial calibration utilizing standard solutions prepared at concentrations of 20, 40, 80, 120 and 160 ug/mL while normally utilizing a reporting limit of 10 ug/L is based on method 8270 requirements in SW-846 (1986). In Section 5.6 of method 8270 the language states that "one of the calibration standards should be near, but above, the method detection limit". Enseco-RMAL performs MDL studies on regular basis that support the 10 ug/L reporting limits. However, at the request of the USEPA Region V Quality Assurance Section and for this specific project only, the reporting limit will be 20 ug/L.

For the purposes of this project, the fifth paragraph under Section 8.8.2 (beginning with ....."If the samples are NOT being analyzed for these specific compounds....") is deleted.

Section 8.8.2.1: The 1-2 uL injection volume referenced is correct. Actual injection volume is documented in the raw data and accounted for in the calculations.

On the last line of this section, the reference to (Section) 8.7, should actually refer to (Section) 8.6 of the SOP, dealing with instrument conditions during calibration.

Section 8.8.2.5: For the purposes of this project, the last sentence under Section 8.8.2.5 is deleted.

Section 8.8.3.1: The 1-2 uL injection volume referenced is correct. Actual injection volume is documented in the raw data and accounted for in the calculations.

On the last line of this section, the reference to (Section) 8.7, should actually refer to (Section) 8.6 of the SOP, dealing with instrument conditions during calibration.

Section 8.10.6: Library searches of up to 20 unknown peaks will be performed.

Section 8.10.10: Mass spectra, chromatographs, tuning and calibration data, daily standard and continuing calibration check information et., will be included as a part of raw data packages. These data will be available to the data validation organization and to regulatory agencies for auduting.

Section 9.5: Matrix spike/matrix spike duplicate analysis will be performed, however, for drilling mud matrix samples taken during drilling no recovery control limit requirements will be applicable. For any ground water matrix samples, control limits of 80% - 120% will be an objective, but not a requirement. After one year of experience working with the ground water matrix, control limit reqirements will be set.

Table A-1: For a list of Appendix IX parameter reporting limits, please refer to QAPjP Appendix A-10.

Table B-5 The compounds and concentrations listed are calibration standards to be utilized.

DFTPP Ions: DFTPP key ions and ion abundance criteria are included in Table C-1, on page 60 of 64 in the SOP.

SOP Appendix A: This SOP is generic in nature, and intended to be sufficiently flexible to address the requirements of multiple clients and/or regulatory agencies. For the purposes of this particular project, Appendix A is not applicable.

Relative Retention Times:
Target parameters and and their respective retention times are indicated QAPjP Appendix B-12A.

Summary tables of target compounds are found in the GWMP Section 7, pages 9 through 11, and in Table 7-1.

Texas World
Operations, Inc.

January 11, 1993

VIA: FEDERAL EXPRESS
AIRBILL NO. 0485203622

Mr. Nathan Wiser WD-17J
United States Environmental Protection Agency - Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Final SOP Additions to the CWM-Vickery Quality Assurance Project Plan (QAPjP)

Dear Mr. Wiser:

At the request of Mr. Steve Lonneman, please find enclosed two (2) sets of the following data to be added to the CWM Vickery QWMP QAPjP :

A) New Title and Approval page. (Replace QAPjP Section I)

B) New Table of Contents. (Replace QAPjP Section II)

C) Enseco organophosphorus pesticides standards preparation SOPs 2500; 2501; 2502; 2503 and 2504. (Add to QAPjP Appendix B-10C in vol. 1)

D) QuantaLex data validation procedure for water miscible solvents. (Add to QAPjP Appendix H in vol. 4)

E) QuantaLex data validation procedure for organophosphorus pesticides. (Add to QAPjP Appendix H in vol. 4)

As noted in my December 9, 1992 transmittal letter, there is some concern regarding the criteria stated for the application of qualifier flags to the data during validation. The use of flags as qualifiers to the data is intended to show where data is usable to support project decision making. We have some concerns regarding the criteria utilized to determine when flags are to be used, what type of flag will be used and how the flags will be interpreted relative to data usability decisions.

CWMGWMP\QAPP592\ADD1-11.CVL

We still believe that following regulatory review, a telephone conference call may be required with all involved parties to reconcile any remaining deficiencies in the GWMP and QAPjP, prior to implementation of the plan.

Please call me at (713) 850-0003 if you have any questions or comments.

Sincerely,

TEXAS WORLD OPERATIONS, INC.

James E. Sandt
Geologist

Additional Distribution:

Mr. Steve Lonneman
Chemical Waste Management, Inc.
3965 State Route 412
Vickery, Ohio 43464

cc letter
Two (2) data sets
Airbill No. 0485203633

Ms. Mary Lou Hodnett
Ohio Environmental Protection Agency
1800 Watermark Drive
Columbus, Ohio 43266

cc letter
One (1) data set
Airbill No. 0485203644

Ms. Marti Pruhs
WMI- Environmental Monitoring Laboratories, Inc.
2100 Cleanwater Drive
Geneva, IL 60134

cc letter
One (1) data set
Airbill No. 0485203655

Ms. Maureen McDevitt
Enseco - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002

cc letter
One (1) data set
Airbill No. 0485203666

Additional Distribution (continued)

Mr. Robert Thielke QuantaLex Inc. 300 Union Boulevard, Suite 600 Lakewood, Colorado 80228	cc letter cc 12/9/92 letter One (1) data set Airbill No. 0485203670
Ms. Sheryl Silberman Texas World Operations 520 Post Oak Boulevard, Suite 450 Houston, Texas 77027	cc letter No data

Texas World
Operations, Inc.

December 9, 1992

VIA: FEDERAL EXPRESS
AIRBILL NO. 5466168234

Mr. Nathan Wiser WD-17J
United States Environmental Protection Agency - Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Additions to the CWM-Vickery Quality Assurance Project Plan (QAPjP)

Dear Mr. Wiser:

At the request of Mr. Steve Lonneman, please find enclosed two (2) sets of data validation procedures to insert into Appendix H (in Volume #4) of your the QAPjP sets. The validation procedure for Method 8140 (Organonphosphorous Pesticides) is undergoing revision by QuantaLex, and a procedure for validation of miscible solvents analysis is being formulated. Additionally, revisions of the analytical SOPs for Organophosphorus Pesticide standards preparation have not yet been completed by Enseco. These procedures will be forwarded as soon as possible.

There is some concern regarding the criteria stated for the application of qualifier flags to the data during validation. The use of flags as qualifiers to the data is intended to show where data is usable to support project decision making. We have some concerns regarding the criteria utilized to determine when flags are to be used, what type of flag will be used and how the flags will be interpreted relative to data usability decisions.

We feel it appropriate for USEPA and OEPA to review the procedures as presented in the QAPjP, and make any comments that are felt necessary at this time. Following regulatory review, a telephone conference call may be required with all involved parties to reconcile any remaining deficiencies and address the concerns noted in the preceding paragraph, prior to implementation of the GWMP.

CWMGWMP\QAPP592\ADD12-8.CVL

Please call me at (713) 850-0003 if you have any questions or comments.

Sincerely,

TEXAS WORLD OPERATIONS, INC.

James E. Sandt
Geologist

Additional Distribution:

Mr. Steve Lonneman
Chemical Waste Management, Inc.
3965 State Route 412
Vickery, Ohio 43464

cc letter
Two (2) data sets
Airbill No. 6192291566

Ms. Marti Pruhs
WMI- Environmental Monitoring Laboratories, Inc.
2100 Cleanwater Drive
Geneva, IL 60134

cc letter
One (1) data set
Airbill No. 5466168223

Ms. Maureen McDevitt
Enseco - Rocky Mountain Analytical
4955 Yarrow Street
Arvada, Colorado 80002

cc letter
One (1) data set
Airbill No. 5466168212

Ms. Mary Lou Hodnett
Ohio Environmental Protection Agency
1800 Watermark Drive
Columbus, Ohio 43266

cc letter
One (1) data set
Airbill No. 5466168201

Ms. Sheryl Silberman
Texas World Operations
520 Post Oak Boulevard, Suite 450
Houston, Texas 77027

cc letter
No data

CWMGWMP\QAPP592\ADD12-8.CVL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

MEMORANDUM

Date: November 27, 1992

Subject: Additional Information Requested for the QAPjP for Chemical Waste Management, Inc. (CWM) Ground Water Monitoring Plan

From: Nathan Wiser (WD-17J) NW

To: Kevin Bolger (SQQ-14J)

As we discussed in a telephone conference call with CWM and Enseco Laboratory on October 23, 1992, additional information was to be provided to the Region in order to meet QAPjP approval requirements. A partial submission of this information was made on November 20, 1992. I enclose a copy of this submission for you and will forward the remaining material to you when I receive it. If you have any questions, please call me at 353-9569.

Attachments

QAS # 024

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SQ-14J

MEMORANDUM

DATE: SEP 10 1992

SUBJECT: Partial Approval of the Revision 1 Quality Assurance Project Plan (QAPjP) Addendum to the Groundwater Monitoring Plan for the Chemical Waste Management (Vickery, Ohio) U.I.C. Facility

FROM: Valerie J. Jones
Regional Quality Assurance Manager

TO: Ed Watters, Chief
Safe Drinking Water Branch

ATTENTION: Nathan Wiser, Project Coordinator

I am providing partial approval of the subject revised QAPjP (QAS WD Log-In # 14) received on July 29, 1992. A complete approval cannot be provided at this time since a number of responses from Enseco did not adequately address deficiencies noted in the December 13, 1991 memorandum from George Schupp of my staff. In addition, several general QAPjP items from Chemical Waste Management/Texas World Operations remain to be resolved. It should be noted that significant progress has been made towards addressing many issues itemized in the December 1991 memo. Attachment 1 details the remaining deficiencies.

In addition, an oversight was noted regarding dioxin analyses in comments under section 4.0. This comment is considered new but pertinent to the project.

I recommend that sampling and lab activities should not commence until the remaining issues have been adequately addressed. The partial approval will allow for the installation of monitoring wells prior to the onset of inclement weather. The approval page indicating the partial approval may be found as Attachment 2 of this memorandum.

I strongly suggest another conference call with the facility prior to their preparation of another revision. If you have any questions regarding the partial approval or the remaining deficiencies, please contact Kevin Bolger of my staff at 3-7712.

ATTACHMENT 1: REMAINING QAPjP DEFICIENCIES FOR THE CWM GROUNDWATER MONITIORING PLAN (REVISION 1 DATED 5-29-92)

All comments are listed by section number:

4.0 PROJECT ORGANIZATION AND RESPONSIBILITY.
Page 2 of 5 indicates that ENSECO-RMAL will perform all chemical analysis work with exception of dioxin analyses which shall be performed by ENSECO-CAL. This poses two questions:

- Dioxin analyses are not discussed elsewhere in the QAPjP nor are ENSECO's SOPs provided. If dioxin is to be analyzed, each QAPjP element must incorporate this analysis, its QA requirements, etc. If dioxin is not to be analyzed, it should be deleted.
- Table IV-1 (ENSECO Laboratories) should only specify the address/phone numbers of ENSECO-RMAL (and ENSECO-CAL if dioxin will actually be analyzed).

Please reconcile these two questions.

11.0 DATA REDUCTION, VALIDATION AND REPORTING.
Data validation and data reporting requirements still are not understood by the facility. A complete data package which shall completely document each analysis and associated calibration with all raw data (chromatograms, mass spectra, ICP/AA printouts), summary QC and results forms, etc. A description of this package (including examples) must be provided for each analysis. An example of such a package are the data deliverables in the USEPA CLP RAS Statements of Work.

The purpose of putting together a data package is to allow for data validation to be conducted by an entity outside of the laboratory. Data validation is the process of qualifying all field and lab data on the basis of outlier field/lab QC performance. Data validation should be detailed in standard operating procedures for each analysis type (GC/MS of volatiles, GC/MS of semivolatiles, anion analysis by ion chromatography, etc). The information provided ENSECO only describes procedures performed by the lab prior to release of its data to a client and does not constitute data validation as described above.

Both of these related issues must be addressed in the QAPjP section 11 along with providing applicable SOPs in Appendices B and C.

16.0 QUALITY ASSURANCE REPORTS TO MANAGEMENT.
Specify that the USEPA Region 5 Project Coordinator, as part of the project management, shall receive and review all QA reports.

APPENDICES.
APPENDIX B: ENSECO STANDARD OPERATING PROCEDURES.
General Comments.

a) A general deficiency common to most of the ENSECO SOPs is the lack of specification of the concentration of each target parameter in each multipoint initial and single point continuing calibrations. ENSECO's response should specify the concentrations of the initial/ continuing calibrations upon which the method was validated with the qualifier that deviations from the method will be documented in each data set narrative.
b) A complete description of the data reporting package which ENSECO shall provide to CWM/Texas World for each analysis type must be detailed per the comments stated above.

B-3: Metal Analysis by ICP.
Calibration standard solution concentrations must be specified.

B-4: GFAA Analysis.
The linear range of each analyte along with the preparation & concentrations of each standard solution must be specified.

B-7: Ammonia Nitrate & Nitrite
ENSECO's response for blank control limits (section 9.2 & references to Appendix C-1) still does not provide explicit control limits for this method. Please specify these limits.

B-9: Phenoxyacid Herbicides by EC/GC.
ENSECO's response did not identify the method linear range, the concentration & procedures used to prepare all initial/continuing calibration standards, surrogates and matrix spikes. In addition, a single column must be identified as the primary column used to identify and quantitate each analyte; the secondary column must also be identified. A summary table identifying all analytes in retention order and approximate retention time should be provided as part of the method.

B-10: Organophosphorus Pesticides by Flame Photometric GC.
Ditto B-9 comments along with the criteria used to qualitatively identify each target parameter.

B-11: Organochlorine Pesticides and PCBs.
Ditto comment B-9.

B-12: GC/MS Analysis of Semivolatile Organics.

8.8.2. If the lowest point in the calibration curve is 20ppB and the reporting limit is 10ppB, either the reporting limit must be raised to 20ppB or a 10ppB must be included in the multipoint curve. This is consistent with the most current CLP RAS SOWs and rationale.

8.10.10 For complete data validation, all raw data would need to be provided in the lab's package. This must be reconciled.

In addition, provide a summary table of the target parameters with the relative chromatographic retention order and approximate retention time.

B-13: GC/MS Analysis of Volatile Organics.
It remains necessary to provide matrix spike and surrogate recovery control limits.

B-20: Total, Fixed and Volatile Solids.
Provide control limits for duplicate analyses.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

Rcvd MQAB
7-29-92

REPLY TO THE ATTENTION OF:

WD-17J

MEMORANDUM

Date: JUL 27 1992

Subject: Request for Review of Quality Assurance Project Plan (QAPjP)

To: George Schupp, Chief
Quality Assurance Section (SQQ-14J)

From: for Richard Zdanowicz, Chief
Underground Injection Control Section (WD-17J) John C. Taylor

Following a rather lengthy hiatus, Chemical Waste Management, Inc. (CWM) has submitted the requested revision to their QAPjP for the deep Ground Water Monitoring Well to be installed at the Vickery, Ohio, hazardous waste disposal facility. The first review of this QAPjP was made by Dr. Cheng-Wen Tsai in December of 1991. Subsequently, Kevin Bolger has answered questions posed by CWM's consultant. Kevin also met with the consultant and Nathan Wiser of my staff on April 28, 1992, to discuss the deficient QAPjP. In answer to comments made by all Region 5 personnel involved, CWM has now submitted this revised QAPjP. Please review this version so that we may ascertain whether CWM needs to submit further documents prior to our approval of the project.

Attached are (1) the letter sent to CWM, dated March 17, 1992, requesting additional revision to the QAPjP, and (2) the revised QAPjP. Thank you for you assistance. If you have any questions, you may call Nathan Wiser of my staff at 353-9569.

Attachments

Texas World
Operations, Inc.

RCVD MQAB
7-29-92

July 14, 1992

RECEIVED

JUL 15 1992

UIC SECTION
EPA — REGION V

VIA: FEDERAL EXPRESS
AIRBILL NO. 2352339382

Mr. Nathan Wiser WD-17J
United States Environmental Protection Agency - Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Re: Revised CWM-Vickery Quality Assurance Project Plan (QAPjP)

Dear Mr. Wiser:

At the request of Mr. Steve Lonneman, please find enclosed two (2) revised and complete copies of the Vickery GWMP QAPjP. This new two volume QAPjP version completely replaces all previous versions of the QAPjP.

The document has been reviewed by Enseco and WMI-Environmental Monitoring Laboratories. The revised QAPjP addresses all the questions raised by the USEPA Quality Assurance Section in the March 17, 1992 letter to CWM, as well as previous comments received from the Region V UIC Section.

Please call me at (713) 850-0003 if you have any questions or comments.

Sincerely,

TEXAS WORLD OPERATIONS, INC.

James E. Sandt
Geologist

cc: Sheryl Silberman - Texas World
Steve Lonneman - CWM Vickery

CWM-VK\GWMP QAPP VER 1.0 final

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SQ-14J

MEMORANDUM

DATE: FEB 11 1992

SUBJECT: Conditional Approval of the Third Revision Quality Assurance Project Plan - Addendum to the Laboratory Core Testing Plan for the Chemical Waste Management, Inc. in Vickery, Ohio

FROM: Valerie J. Jones
for Regional Quality Assurance Manager

TO: Richard J. Zdanowicz, Chief
Underground Injection Control Section

ATTENTION: Nathan M. Wiser, Project Coordinator

I am providing conditional approval of the third revision, Quality Assurance Project Plan (QAPjP) - addendum to the laboratory core testing plan - for core testing activities at the Chemical Waste Management (CWM) Inc.. This approval is provided after QAS staff has reviewed the revised pages received by the Quality Assurance Section (QAS) on February 7, 1992 (QAS Log-In No. 5). The condition for this approval is that changes made by QAS staff to facilitate this subject QAPjP for approval, which are listed in the Attachment, shall be incorporated in the finalized document.

The original signature page is included. Please have the project coordinator provide final sign-off, and send us a copy of the completed signature page within 2 weeks of this memo.

Attachment

ATTACHMENT

1. Section VII (Sample Custody)

   a. "SMO number" in 11.2 is changed to "Sample number".

   b. 17.2 is revised to read, "Mail the original TR cover sheet to Site Manager within three days of receipt of the samples."

2. SOP 2.2, the first sentence of Section 9 (Data Reporting) is revised to read, "The data will be present in tabulated form (in unit of weight %) as seen in Section IX page 19C."

3. SOP for Total Organic Carbon (TOC)

   a. The last sentence of 6.2.6 is deleted.

   b. In Section 7.1.2, the last three sentences are revised to read, "The concentrations of ICVs for each instrument ranges are 50 mg/L, 200 mg/L and 2000 mg/L respectively. Acceptance criteria requires the percent recovery to be within 88-112% of the true value."

4. SOP for Chloride Analysis

   a. In Section 1.3, the last two sentences, "The concentration of these samples is expected to be 8000 mg/L. A dilution of 1 to 100 will be performed." is revised to read, "If the concentration of any sample exceeds the working range, a dilution factor will be calculated and sample diluted accordingly."

5. SOP for Alkalinity

   a. In Section 4.2.1, "$Na_2S_2O_2$" is changed to "$Na_2S_2O_3$".

I. TITLE PAGE AND QAPjP APPROVAL

QUALITY ASSURANCE PROJECT PLAN

FOR

CHEMICAL WASTE MANAGEMENT, INC

VICKERY, OHIO

ADDENDUM TO THE

LABORATORY CORE TESTING PLAN

APPROVALS

Region V Project Coordinator

_____

Region V Quality Assurance Manager

_____

Chemical Waste Management, Inc. Project Manager

_____

Texas World Operations, Inc. Project Manager

_____

Core Laboratories, Inc. Project Manager

_____

5. Compare the documents listed below to verify agreement of the information contain on them. Document both agreement among the forms and any discrepancies found.

   5.1 Chain-of-custody records

   5.2 Sample tags

   5.3 Traffic Reports

   5.4 Airbills or bills of lading.

6. If all samples recorded on the chain-of-custody record were received by the lab and there are no problems observed with the sample shipment, the custodian will sign the chain-of-custody record in the "received for laboratory by:" box.

7. If problems are noted, sign the chain-of-custody record and then note problems in remarks box.

8. Determine the SDG number as follows: If the case is comprised of only one shipment, the SDG will be the lowest alphanumeric number received. If a case is received in more than one shipment in less than a 14 day period, the SDG will be the lowest alphanumeric number of the samples received the first day.

9. On the Traffic Report for each sample, record the SDG number below the "Date Received". If all of the samples are received on one Traffic Report, then the SDG will be recorded in only one place. On the TR for the "Last" sample in the SDG, record "LAST SAMPLE" in the side margin.

10. If the samples are for inorganics, notify the Metals Supervisor that samples have arrived and obtain the Project Number from her that she will use in her ICP program.

11. Log-in the samples to the ALTOS' LABSYS as follows:

    11.1 Call up the client file in the computer file for EPA-CLP projects - the number is 670. The lab numbers are automatically assigned sequentially by LABSYS.

    11.2 "SAMPLE DESCRIPTION" = Sample number

    11.3 "DATE AND TIME TAKEN" = as recorded on the chain-of-custody form

    11.4 "DATE AND TIME RECEIVED" = Validated Time of Sample Receipt (VTSR) of that sample

    11.5 "NUMBER OF SAMPLES" = number of samples in SDG

    11.6 "REPORT DUE" = 28 days from VTSR of last sample received in the SDG

12. The Altos system will automatically generate a log-in sheet (see Figure 2.7) containing all of the above-mentioned information and sample labels for each sample container. Affix the sample labels to the sample container.

13. The sample custodian will then remove the sample tags and set them aside. If stick-on labels are used instead of tie-on sample tags, this fact should be noted in the comment section of the sample receipt form. If tags are disposed of due to suspected contamination, this disposal should be noted on the sample receipt documentation.

14. Fill out the TR Cover Sheet

15. Complete the sample receipt form. Answer all questions and fill in all blanks. If empty lines remain, place a mark through the unneeded spaces.

16. Gather the following documents together, and make the indicated number of copies for each:

    16.1 TR Cover Sheet - 2 copies

    16.2 Traffic Report(s) - 2 copies

    16.3 Chain-of-custody form - 2 copies

    16.4 Airbill - 1 copy

    16.5 Sample Tags - 1 copy

    16.6 Log-in sheet - 6 copies

    16.7 Sample receipt form - 1 copy

17. Collate and distribute these documents as follows:

    17.1 The appropriate supervisor (Metals Supervisor for Inorganic samples and GC Supervisor for Organic samples) should receive five copies of the log-in sheet and one copy of the TR Cover Sheet, traffic reports, and chain-of-custody form.

    17.2 Mail the original TR Cover Sheet to Site Manager within three days of receipt of the samples.

    17.3 Staple together a copy of the TR Cover Sheet, Traffic Report(s), Airbill, sample tags, and Chain-of-custody forms. Place these in the case file for submission with the final data package.

    17.4 Staple together the original sample receipt form, original sample tags, original airbill, original Lab file copy of the TR, and the original Chain-of-Custody

digital reading.

6.2.4 Using the appropriate size syringes, repeat the above step in the other two ranges with the following changes:

200 uL range uses the 400 mg/L TOC standard
400 uL range uses the 2000 mg/L TOC standard
or,

40 uL of the 2000 mg/L stock standard solution injected in the 200 uL mode resulting in a 400 mg/L concentration.

The following values should be obtained in the "ppmC" mode before proceeding:

Sample Volume	Acceptable Range
1 mL	7.50 +/- 1.85
200 uL	300 +/- 75
400 uL	1500 +/- 375

6.2.5 The above steps will provide you with an overall indication of system performance, and should be performed on a monthly basis, or after any maintenance has been performed.

6.2.6 Once the system performance criteria are met, another volume of standard shall be injected. Upon termination of the analysis, depress the "CALIB" button for at least one second. The button will illuminate indicating that the range is now calibrated. Inject a standard from an external source to verify the calibration. The readout of TOC in mg/L must be within +/- 10% of the expected value or the instrument must be re-calibrated. Repeat this procedure for each range to be used.

6.3 Sample analysis.

6.3.1 The following preliminary steps must be taken to avoid erroneously high TOC values resulting from inorganic carbon.

6.3.2 Lower the pH of the sample to 2 with 1:1 phosphoric acid.

6.3.3 Purge the sample with oxygen for 4-6 minutes.

STANDARD OPERATING PROCEDURES 2.2 cont.

$$I_{inf} = I_{thin}/[1-\exp(-2ut/\sin\ )]$$

that corrects all two-theta position intensities to those of an infinitely thick mount. By measuring the intensity of the silver peak on the unknown sample versus that of an external standard of pure silver, the exact thickness of the sample substrate can be calculated and all intensities can be converted to that of an infinitely thick "powder mount".

Poor alignment of the X-ray diffractometer can also lead to serious errors and is remedied by frequently observing the most intense peak of alpha quartz which occurs at approximately 26.66 degrees two theta and making adjustments to goniometer position as needed. Any time a diffractometer is moved, it is necessary to align the diffractometer.

9. Data Reporting

The data will be present in the tabular form (in unit of weight %) as seen in Section IX page 19C. In Addition, the following will be provided:

a) Case narrative as outlined.

b) Summary of initial calibration as detailed above. This calibration is performed only once until a major change is effected.

c) Summary of sample analysis presented as weight percent of each mineral as outlined.

d) Diffractograms.

e) Instrument logbook.

10. Preventive Maintenance

No preventative maintenance is required for the X-ray diffractometer other than checking cooling water levels in the heat exchanger and checking the overall appearance and insuring that all safety interlocks are functioning properly.

11. Quality Control Requirements

In addition to data quality checks by the X-ray analyst, numerous cross checks are performed with thin section analysis. Any discrepancies observed are promptly investigated and, if necessary, samples are re-analyzed to check results. We guarantee that our services, data, reports, and products are provided on-time and meet or exceed industry standards and/or our clients'

6.3.4 Inject the sample into the instrument after pressing the start button. A single analysis should take no longer than 4-5 minutes. The instrument will sound and the "ready" light will illuminate when the analysis is complete. In the "ppmC" mode, the digital readout on the instrument will provide results in mg/L TOC.

mg/L analyzed x dilution factor = mg/L reported value

7. QUALITY CONTROL

7.1 Quality Control Indicators

7.1.1 Method blank: A method blank is a deionized water blank that is subjected to the same conditions that a prepared sample undergoes. Analyze a minimum of one method blank per batch. A batch shall contain twenty samples or less. Acceptance criteria requires the method blank to be less than the reporting limit.

7.1.2 Initial calibration verification/External QC standard - ICVS/external standard must be run daily to verify the accuracy of the calibration standard. The ICV/external standard is purchased from ERA (Environmental Resource Associates). **The concentrations of ICVs for each instrument ranges are 50 mg/L, 200 mg/L and 2000 mg/L respectively. Acceptance criteria requires the percent recovery to be within 88-112% of the true value.**

7.1.3 Continuing calibration verification standard: The calibration standard (4.3.3) must be run after each ten samples analyzed and the percent recovery must be within 88-112% of the true value or the titrant will be recalibrated. The CCVS can be the ICV/External QC standard or a mid-range standard from the calibration curve. The concentration of the continuing calibration standard is 2000 mg/L.

7.1.4 Spike/Spike Duplicate: To two aliquots of same sample, add appropriate amount of spiking solution such that the spiking level will be 35% above sample concentration. Samples shall be spiked/spiked duplicated at the rate of one pair per twenty samples.

- The % recovery shall be calculated on the first spiked sample. Acceptance criteria requires the percent recovery to be within 75-125% of the true value.
- Calculate the (Relative Percent Difference) RPD between the % recovery of the first spike and its

1. INTRODUCTION AND SCOPE

1.1 This method is applicable to ground water, drinking, surface, and saline waters, and domestic and industrial wastes.

1.2 The method is suitable for all concentration ranges of chloride content: however, in order to avoid large titration volume, a sample aliquot containing not more than 10 to 20 mg Cl per 50 mL is used.

1.3 Reporting Limit: 0.5 mg/L
Working Range of Test: 0.5 - 500 mg/L
If the concentration of any sample exceeds the working range, a dilution factor will be calculated and sample diluted accordingly.

2. SUMMARY OF METHOD

An acidified sample is titrated with mercuric nitrate in the presence of mixed diphenylcarbazone-bromophenol blue indicator. In the pH range 2.3 to 2.8 diphenylcarbazone indicates the titration endpoint by the formation of a purple complex with the excess mercuric ions. Xylene cyanol FF serves as a pH indicator and endpoint enhancer. Increasing the strength of the titrant and modifying the indicator mixtures extends the range of measurable chloride concentration.

3. SAFETY

Each employee is directly responsible for complete awareness of all health hazards associated with every chemical that he/she uses. The employee must be aware of these hazards, and all associated protective wear and spill clean-up procedures PRIOR TO THE USE of any chemical. In all cases, both the applicable MSDS and supervisor or Safety Officer should be consulted. The bottle labels also provide important information that must be noted. Personnel performing this procedure may be working with flammables, poisons, toxics, carcinogens, teratogens, mutagens, and biohazards. In particular, approved gloves, safety glasses, and labcoats must be worn, and solvents will be handled in ventilated hoods, in addition to other measures prescribed by the Division.

4. REAGENTS AND MATERIALS

4.1 Apparatus

4.1.1 Hot plate

4.1.2 Buret, borosilicate glass, 50 mL, with 0.1 mL graduations

4.2 Reagents

4.2.1 Sodium thiosulfate, 0.1N: Dissolve 25g $Na_2S_2O_3.5H_2O$ and dilute to 1000 ml with deionized water.

4.3 Standards

4.3.1 Sodium carbonate solution, approximately 0.05N: Dry 3 to 5 g primary standard Na2CO3 at 250 degrees C for 4 hours and cool in a desiccator. Weigh 2.5 ± 0.2 g (to the nearest mg), transfer to a 1-L volumetric flask, fill flask to the mark with distilled water, and dissolve and mix reagent. Do not keep longer than 1 week.

4.3.2 Standard sulfuric acid or hydrochloric acid, 0.1N: prepare acid solution of approximate normality as indicated under Preparation of Desk Reagents. Standardize against 40.00 mL 0.05N Na2CO3 solution, with about 60 mL water, in beaker by titrating potentiometrically to pH of about 5. Lift out electrodes, rinse into the same beaker, and boil gently for 3 to 5 min under a watch glass cover. Cool to room temperature, rinse cover glass into beaker, and finish titrating to the pH inflection point. Calculate normality:

$$\text{Normality, N} = \frac{A * B}{53.00 * C}$$

Where:

A = g Na2CO3 weighed into 10L flask,
B = mL Na2CO3 solution taken for titration,
C = mL acid used.

4.3.3 Standard sulfuric acid or hydrochloric acid, 0.02N: Dilute 200.00 mL 0.1000N standard acid to 1000 mL with distilled or deionized water. Standardize by potentiometric titration of 15.00 mL 0.05N Na2CO3 according to the procedure of (4.3.2.) 1mL = 1.00mg CaCO3.

5. INTERFERENCES

Soaps, oily matter, suspended solid, or precipitates may coat the glass electrode and cause a sluggish response. Allow additional time between titrant additions to let electrode come to equilibrium or clean the electrodes occasionally. Do not filter, dilute, concentrate, or alter sample.

RCVD MCAB
7-29-92

MAR 17 1992

WD-17J

CERTIFIED MAIL P-874-123-477
RETURN RECEIPT REQUESTED

Fred G. Nicar, General Manager
Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

Re: Review of the Quality Assurance Project Plan (QAPjP) Addendum to the Groundwater Monitoring Plan, Dated October 11, 1991

Dear Mr. Nicar:

Staff from the Quality Assurance Section and Underground Injection Control Section have completed a review of the above-referenced QAPjP. At this point, we are pleased that Chemical Waste Management (CWM) has made progress toward development of an approvable QAPjP, but there are remaining deficiencies which must be adequately addressed prior to receiving final approval. These deficiencies are itemized in the enclosed attachment. Please note that all references in the attachment to replacing "Dissolved" metals with "Total" metals may be disregarded. We understand that the purpose of measuring the dissolved metals fraction is to examine the groundwater for the presence of metal ions which are likely to be dissolved, not adsorbed, species in the groundwater. In addition, the method of choosing those parameters to be included in the sampling of the Knox interval after the initial sampling event is not acceptable.

It is stated in Section III, Revision 0 of the QAPjP (page 15 of 22), that detection of parameters "at levels above the Practical Quantitation Limit (as defined in the methods of RCRA Waste Analysis Guidance SW-846, third edition, 1986) or the Maximum Contaminant Level, (or Health Based Limit) if one exists for that parameter, whichever value is higher, will continue to be included on the list of parameters tested for in future Knox-Kerbel monitor zone sampling events". The use of this criteria would be logical if the aquifer was being monitored for degradation of the groundwater quality with respect to drinking water standards. However, the purpose for monitoring the zone is to detect any upward migration of injected waste. It is therefore imperative that the detection of a parameter which may be in the injectate, or the observation of native groundwater constituent concentrations, be evaluated so as to ascertain how the parameter's value changes through time, if at all. Maximum Contaminant Levels (MCLs) are always at least as high as, if not two to three orders of magnitude higher than, Practical Quantitation Levels (PQLs). Given this discrepancy, it is quite conceivable that a parameter would be omitted from any subsequent events when it was actually above the detection limit during the first such event. The effect of this on the list of parameters to

be monitored in Knox-Kerbel interval sampling events subsequent to the initial such event is obvious.

We remind CWM that it is now long past the June 7, 1991, deadline for fulfillment of Condition #6 of the Exemption from Land Disposal Restrictions, issued on August 8, 1990. Your timely response to this letter is expected.

Should you have any questions regarding this matter, please feel free to contact Nathan M. Wiser, of my staff at (312) 353-9569.

Sincerely yours,

Richard J. Zdanowicz, Chief
Underground Injection Control Section

Enclosure

cc: Mary Lou Hodnett, Ohio EPA

P 874 123 477

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

WD-17J (UIC) NATHAN WISER

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.
1. ☐ Show to whom delivered, date, and addressee's address. †(Extra charge)† 2. ☐ Restricted Delivery †(Extra charge)†

3. Article Addressed to:
Fred G. Nicar
General Manager
Chemical Waste Management, Inc.
3956 State Route 412
Vickery, OH 43464

4. Article Number P 874 123 477

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5. Signature — Addressee
X FG Nicar

6. Signature — Agent
X

7. Date of Delivery 3-23-92

8. Addressee's Address (ONLY if requested and fee paid)

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2

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SQ-14J

MEMORANDUM

DATE: DEC 13 1991

SUBJECT: Review of the Initial Draft Quality Assurance Project Plan - Addendum to the Groundwater Monitoring Plan for the Chemical Waste Management, Inc. in Vickery, Ohio

FROM: George C. Schupp, Chief
Quality Assurance Section

TO: Richard J. Zdanowicz, Chief
Underground Injection Control Section

ATTENTION: Jim Paulson, Project Coordinator

We have reviewed the initial draft, Quality Assurance Project Plan (QAPjP) - addendum to the groundwater monitoring plan (GWMP)- for monitoring well installation and monitoring activities at the Chemical Waste Management (CWM), Inc., which was received by the Quality Assurance Section (QAS) on November 5, 1991 (QAS Log-In No. 55). This subject QAPjP is not acceptable until deficiencies listed in the Attachment are adequately addressed.

Per Jim Paulson's request, comments on the Groundwater Monitoring Plan (GWMP) are limited to sections that were referenced in the subject QAPjP.

Based on our expertise and QA experience, several comments identified in our review of the QAPjP need to be addressed in order to receive formal approval by the Regional Quality Assurance Manager. However, those comments annotated with an asterisk (*) are being provided to you for your review and consideration strictly from our concern to further protect the environment, public health, and safety, or for clarity.

If you have any questions regarding this memo, please contact Cheng-Wen Tsai, of my staff, at 886-6220.

Attachment

ATTACHMENT

QUALITY ASSURANCE PROJECT PLAN

I. TABLE OF CONTENT

A. Please include the page number for all sections and subsections

II. PROJECT DESCRIPTION

A. In Section 4.3 (Intended Data Usage), please address the usage data from field measurements that are specified in Table III-1.

B. In Section 5.0 (Target Parameters), please address the following

1. A parameter list including the required method detection lim should be included in this section.

2. Appendix IX parameters are specified to be tested for cert samples. It is not clear, however, whether it means the who Appendix IX parameter list or only part of the list. Ple clarify it accordingly.

3. In page 12 of 22, please address the following:

   a. "trans-1,2-Dichloroethene" should be changed to "1 Dichloroethene (Total)".

   b. "1,3-Dichloropropene" should be changed to "trans-1,3-Dichloro-propene" and "cis-1,3-Dichloropropene".

4. In page 13 of 22, please address the following:

   a. Samples for inorganics should not be field filtered.

   b. "Dissolved metal" should be changed to "Total metal".

   c. Please clarify whether "alkalinity" and "total dissolved carbonate" are both needed. Please clarify it and make any necesary changes in page 13 and 14 of 22.

   d. In page 14, 15 of 22, it is not clear whether the wh Appendix IX paameters will be tested for all rounds samples. If the answer is "No", then we suggest that should be done for the first round of samples. The numb Appendix IX parameters to be tested can be reduced only

the analysis of the first round of samples.

e. In page 16 of 22, the "dissolved metals" should be changed to "total metals", and the footnote of field filtration should be deleted.

5. Table III-1 should be revised for the following:

a. Lab parameter should be separated into several parameter groups (volatile organics, metals, general chemistry, etc.). See the example 1 of this Attachment.

b. Trip blank is not required for parameter/parameter groups other than volatile organics. Please correct it.

c. For Appendix IX parameters, it should also be divided in to different parameter groups per comment II.5.a of this attachment.

6. Table III-2 should be revised per comment II.5 of this attachment.

C. A section should be added to address the geological formation, hydrogeological information of the monitoring site.

III. PROJECT ORGANIZATION AND REPSONSIBILITY

A. Please identify which ENSECO lab is selected for this project. The address of the selected ENSECO laboratory should be provided in this Section.

B. In page 3 of 5, the sentence, "Region V Central Regional Laboratory (CRL) and/or Central District Office (CDO) are responsible for external performance and system audits." should be revised to read, "Region V Central Regional Laboratory (CRL) is responsible for external performance and system audits of ENSECO laboratory, and Region V CRL and/or Central District Office (CDO) are responsible for external performance and system audits of field activities."

C. In Table IV-1, please address the following:

1. For external audits of field procedures, please add "Region V CRL/CDO".

2. For external audits of lab procedures, please delete "/CDO".

IV. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION ACCURACY, COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY

A. For assessing precision, the percent relative difference (RPD) of MS/MSD analysis is used for organic analysis, and RPD of duplicate analysis is used for inorganic analysis. Please revise Section 1.2 to reflect this requirement.

B. The acceptance control limits for accuracy, precision and completeness that are required for the project should be specified.

C. For representativeness, please add a bullet to state that sample will be analyzed within the allowed holding time using the approved methods.

V. SAMPLING PROCEDURE

A. A summary table of sample containers, preservation, technical holding time requirements should be provided in this section. See also comments on Appendix A of this attachment.

B. For each sample matrix, please add a statement to address the collection of field duplicate samples.

C. Samples, including make up water and ground water, for both metals and other inorganic parameters should not be field filtered.

D. For drilling mud, please state whether the mud samples will be collected and analyzed as a whole sample (supernatant plus mud) or else.

E. A bound field logbook should be used to document all field activities. Entries to the logbook, as a minimum, should include the following:

- o Date/time of sampling;
- o Location;
- o Sampler;
- o Sample handling, preservation and filtration;
- o General observation;
- o Weather condition;
- o Sample ID number, etc.

Please address them in page 17 of 17 (Section 9).

F. Table VI-1 and VI-2 should be revised per comments II.5 and II.6 of this attachment.

G. In page 15 of 17, the first sentence of the first paragraph is incorrect. Trip blanks, field blanks and field duplicate samples are used to check field sampling procedures, not the performance of the laboratory. Please address it accordingly.

H. In Section 8.1 (Trip Blanks), the statement regarding the frequency of preparing trip blanks and the information provided by the results of trip blank analysis are incorrect. Please correc the following:

1. Trip blank sample (for volatile organics only), which consists of two 40-ml vials, should be placed in each shipping cooler of VOA samples.

2. The trip blank samples are used to check for any corss-contamination as a results of diffusion through the septa during sample shipment and storage. Please correct.

I. In Section 8.2 (Field Blanks), please address the following:

1. The field blank should be prepared by filling sample bottles with deionized water that has been routed through sampling device, including filter if field filtration is performed.

2. The frequency of collecting field blank sample, which is one per group of 10 or fewer investigative samples collected, should be specified.

J. In Section 8.3, the frequency of collecting field duplicate samples is one per group of 10 or fewer investigative samples of same matrix. Please address it accordingly.

VI. SAMPLE CUSTODY

A. See comments on Appendix A for field and laboratory sample custody procedures.

B. The evidence file should also include correspondences pertaining to this project.

VII. ANALYTICAL PROCEDURES

A. Please change "Dissolved metals" in pages 2 of 11 and 11 of 11 to "Total metals".

B. SOPs for field measurements using instruments such as OVA, HNu, etc. should be provided.

C. A parameter list including the required method detection limits or quantitation limits shouldbe provided.

VIII. INTERNAL QUALITY CONTROL CHECK

A. See comment V.H of this attachment for the usage of trip blank data. Please address it in Section 1.3.1 (page 2 of 14).

B. See comment V.I of this attachment on the frequency of collecting field duplicate samples, and address it in Section 1.2 (page 1 of 14).

C. See comment V.I of this Attachment on the procedure of preparing field blank and the frequency, and address it properly in Section 1.3.2 (page 2 of 14).

D. For laboratory analysis, internal QC checks are referenced to Appendix C-1. This is not acceptable because Appendix C-1 is nothing but generic statements. We suggest that Appendix C-1 be deleted, and reference the laboratory internal QC checks to each individual SOP.

IX. DATA REDUCTION AND REPORTING

A. The title of this section should be "Data Reduction, Validation, and Reporting".

B. Please add a section to address the data validation. The description should include the procedures and criteria used for validating data.

C. For the reduction of lab data, please reference them to the SOPs.

X. PERFORMANCE AND SYSTEM AUDITS

A. Please add a section to address the interanl and external audits of laboratory.

XI. PREVENTATIVE MAINTENANCE

A. For maintenance of laboratory instruments, a maintenance schedule for routine preventative maintenance should be provided.

XII. CORRECTIVE ACTIONS

A. The description of corrective actions should cover each level of data generation/review.

1. Field Measurements and Sample collection:

   a. Chain of command in initiation, development, approval and implementation of corrective actions on sample collection should be addressed.

   b. For field measurements, the corrective actions on each level of data generation and review should be addressed.

2. Laboratory Analysis:

   a. Chain of command in initiation, development, approval and implementation of corrective actions at each level of data collection/review should be addressed.

XIII. QUALITY ASSURANCE REPORT TO MANAGEMENT

A. U.S. EPA should also receive QA reports because EPA is part of the management team for the project.

XIV. APPENDICES

A. **Appendix A**

1. A-1 (Filtration)

   a. Samples for this project should not be filtered. Please address it.

   b. The first bullet in page 67 which stated that filtration should be done within 2 hours of sample collection is not acceptable. The sample filtration, if required, should be performed within 20 minutes of sample collection.

2. A-3 (Sample Bottles)

   a. A section should be added to address the procedures for cleaning/preparing sample bottles. NOTE: If sample bottles are provided by the laboratory, the SOP for sample bottle preparation that is used by the laboratory should be attached to the QAPjP.

   b. In page 70, it is stated, "A listing of preservatives by analysis is included in the Appendix (A13-A16) for reference only.". This statement is incorrect, and should be rephrased to be "A listing of preservatives by analysis is included in pages A13-A16 of the appendix A-3 for reference only.". See also comment on Appendix A-4.

3. A-4

   a. Water Samples (make-up water and groundwater) for the analysis of volatile organics should be preserved with HCl to pH < 2 and cooled to 4°C.

   b. Footnote 5 in page A17 should be revised as follows:

      o Retaining only the first two sentences, and delete the rest of the paragraph.

      o Add a sentence to state the holding time started at the day of sample collection.

   c. Sample for nitrite or nitrate alone should not be preserved with H2SO4, and the holding time should be 48 hours, instead of 2 weeks.

   d. Sample for the analysis of volatile organics should be preserved with HCL to pH<2 **and** cooled to 4°C.

   e. The sample preservation procedure in page A19 is not acceptable. samples bottle should not be reopened for checking the pH using capillary tube or pH paper, which will result in loss of volatile compounds or contaminating the sample.

4. A-5 (Field Custody Procedure)

   a. A section should be added to address the sample numbering system. This is necessary for the purpose of tracking sample custody.

5. A-7 (Sample Custody Procedure of ENSECO Laboratory)

   a. The chain-of-custody procedure for laboratory analysis should include sample tracking during sample storage, sample preparation (digestion/extraction), and sample analysis.

   b. The referenced Figure 7-2 is missing and should be provided in the next QAPjP submisstion.

6. A-8 (Calibration Procedures and Frequency)

   a. The tuning criteria for both BFB and DFTPP should be included in this section.

7. A-9 (Calibration Procedures and Frequency)

   a. This is nothing but generic statement. We suggest that this appendix be deleted, and reference all calibration procedures and frequency to each individual SOP.

B. **Appendix B (Standard Operating Procedures)**

1. B-1 (Total Dissolved Solids (TDS))

   a. In Section 5, please address the following:

      o A 100 ml sample may not be adequate. We suggest that a minimum of 250 ml sample should be collected.

      o In Section 5.1, it stated that sample may or may not be filtered in the field. This statement is not acceptable. Instead, it should state whether sample will be filtered in field or in the lab. If sample is to be filtered in the lab, then an allowed time frame (e.g., at the time lab receives the sample) should be specified.

   b. In Section 8.1 (Preparation), please state that samples will be filtered as soon as lab receives them.

      NOTE: It is necessary to filter the sample to remove any suspended particulate as soon as possible. Otherwise, some dissolved solids may reprecipitate and lost with the suspended solid through filtration.

   c. Section 8.2.1 should be placed under Section 8.1.

   d. In Section 11.2, results below the reporting limits should be reported as "< MDL", instead of "ND" which was not defined.

2. B-3 (Metal Analysis by ICP)

   a. A section should be added to address the sample preparation. Otherwise, the appropriate SOP for sample preparation should be attached.

   b. Please specify the concentration of each metal in the calibration standard solutions.

   c. In Section 9.0 (QA/QC Requirements), please address the following:

- o The level of matrix spike to be used.
- o the acceptance control limits for the analysis of QC samples.

d. The MDL and/or ENSECO reporting limits for the following metals appear to be high:

- o Thallium;
- o Arsenic;
- o Selenium.

Please correct them.

e. The interelement correction for ICP is not addressed. Please provide the composition and concentration of the standard solution used for this purpose.

3. B-4 (GFAA Analysis)

a. Please specify the actual dynamic linear range for each analyte.

b. In Section 7, please address the preparation of stock standard solution and three level of working standard solutions including their concentrations.

c. In Section 9, please state that duplicate analysis and matrix spike analysis are required at frequency of one per batch of 20 samples prepared/analyzed, and the acceptance control limits are $\pm$ 25% RPD and 90-110% respectively.

4. B-5 (Mercury Analysis)

a. Please specify the actual linear range of the method.

b. In Section 7, please address the preparation of stock standard solution and working standard solutions including the concentration.

NOTE: A minimum of three level of standard solutions should be used for initial calibration to define the working linear range.

c. In Section 9.1.2, the concentration of standard solutions to be used for calibration are too high. Please revise them to 0.05 ug, 1 ug, 2 ug, and 4 ug.

d. In Section 9.5, please state that duplicate analysis and matrix spike analysis are required at a frequency of one per batch of 20 samples prepared/analyzed, and the acceptance control limits are ± 25% RPD and 90-110% respectively.

e. A section should be added to address the data package requirements.

5. B-6 (Anion Analysis by Ion Analysis)

a. In Section 9 (QA/QC Requirements), please address the following:

- Please state in 9.1.4 that duplicate analysis is required at a frequency of one per batch of 20 samples analyzed, and the acceptance control limit should be ± 25%.
- Please state in 9.1.5 that matrix spike anaysis is required at a frequency of one per batch of 20 samples prepared/analyzed, and the percent recovery should be 90-110%.

b. A section should be added to address the data package requirements.

6. B-7 (Ammonia, Nitrate+Nitrite)

a. In Section 9.1.4, it stated that the spiking concentration is 1 mg/L. Please clarify what does it mean (e.g., the final concentration in term of N in the sample, etc.).

b. In Section 9.2, please include the acceptance control limits for blanks.

c. For ammonia analysis, please specify whether distillation will be used. NOTE: If distillation is used for sample, the calibration standards should be distilled as well. Otherwise, a distilled mid-range standard should be analyzed along with each batch of 20 samples to assess the efficiency of distillation.

d. If copper/cadmium column is used, the calibration standards should be treated the same way as sample.

7. B-8 (Total Recoverable Phenols)

a. Since the calibration standards are not distilled with

samples, we require that, for each batch of 20 samples, a mid-range distilled standard be prepared and analyzed with samples to assess the distillation efficiency.

b. In Section 9 (QA/QC REquirements), please address the following:

- o State in 9.1.4 that duplicate analysis will be done at a frequency of one per batch of 20 samples, and the %RPD should be ±25% in 9.2.5.
- o State in 9.1.5 that matrix spike is required at a frequency of one per batch of 20 samples prepared/ analyzed.

c. A section should be added to address the data package requirements.

8. B-9 (Phenoxyacid Herbicides)

a. In Section 1.4, please specify the dynamic linear range for each target compounds.

b. In Section 6, please identify which is the primary column, and which is the secondary (or confirmatory) column.

c. In Section 7 (Reagents and Standards), please address the following:

- o Preparation of secodary standard solution and its concentration;
- o The preparation and concentration of 5 level of calibration standard solutions.
- o Preparation and concentration of surrogate spike compound solution;
- o Preparation and concentration of matrix spike solution.
- o Concentration of continuing claibration check standard.

d. A section should be added to address the data package requirements.

e. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

9. B-10 (Organophosphorous Pesticides)

   a. In Section 6, please identify which is the primary column, and which is the secondary (or confirmatory) column.

   b. In Section 7 (Reagents and Standards), please address the following:

      - o The concentration of the primary standard solution;
      - o Preparation of secodary standard solution and its concentration;
      - o The preparation and concentration of 5 level of calibration standard solutions.
      - o Preparation and concentration of surrogate spike compound solution;
      - o Preparation and concentration of matrix spike solution.
      - o Concentration of continuing claibration check standard.

   c. In Section 8.2.4 and 8.2.5, please specify the amount of surrogate spike solution and matrix spike solution to be used for spiking.

   d. In Section 10 (QA/QC Requirements), please address the following:

      - o A section should be added to address the criteria for qualitative identification of the target compounds.
      - o Please address the frequency of continuing calibration check and the frequency.
      - o Please revise Section 10.1.2 to state that matrix spike and matrix spike duplicate analysis are required at a frequency of one per group of 20 investigative samples.

   e. A section should be added to address the data package requirements.

   f. Please provide a summary table of target compounds and their retention time per the instrument conditionsused.

10. B-11 (Analysis of Organochlorine Pesticids and PCBs)

   a. In Section 2.2, more than one target compound list with

different reporting limtis is included. Please provide only one table containing all target compounds with the required quantitation limits.

b. In Section 7 (Reagents and Standards), please include the calibration standard mixture (compositions and concentrations), surrogate spike standard solution, matrix spike standard solutions, etc.

NOTE: Tetrachloro-m-xylene and decachlorobiphenyl should be used as surrogate.

c. In Section 8.2, please specify the amount of surrogate spike compounds, and matrix spike compounds to be used for spiking.

d. GPC and/or Acid cleanup is required for soil samples.

e. Section 10 (QA/QC requirements) should discuss the requirement of matrix spike analysis, including the compounds to be used for spike and the spike level used.

f. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

11. B-12 (GC/MS Analysis of Semivolatile Organics)

a. In Section 1.2, please address the following:

- The statement, "If a sample contains a high concentration of target compounds or a large amount of interfering material, it will be diluted prior to analysis." is not acceptable. Sample contains some target compound(s) at a relatively high concentration should be analyzed twice - one without dilution to determine the low concentration components, and one with dilution to determine the high concentration components. Results of both analyses be reported.

- Appendix A, B, thru F are referenced in this SOP; however, not all of these referenced appendices are included in the SOPs. Please provide these missing appendices.

b. Please specify the solvent system to be used for solid samples.

c. Sections 7.6 thru 7.10 reference the surrogate spike standard, matrix spike standard, internal standard

solutions, etc., to Appendix B, which is not exist. Please reference these standard solutions to each individual table.

d. For aqueous sample preparation, both separatory Funnel extraction and continuous extraction are listed in the SOP. Please specify which extraction method will be used.

e. In Section 8.8.2 (Initial Calibration), please address the following:

- o It is stated that initial calibration will be done with calibration standards at concentration of 20, 50, 80, 120 and 160 ug/ml. Please change it to 10, 20, 40, 80 and 160 ug/ml.
- o Delete the paragraph, "If samples are not being analyzed for these specific compounds, ...in the analyte set should be documented.".
- o In Section 8.8.2.1, please change "a 1-2 ul injection" to "a 1 ml injection".
- o In Section 8.8.2.4, it states that the concentration of intenal standard is 40 ug/ml, acid surrogate compounds is 100 ug/ml, and base/neutral surrogate compounds is 50 ug/ml. This is inconsistent with the concentrations actually adds to sample based on proposed volume (e.g., 1 ml) and the concentration of working standard solution (Table B-1). Please correct them throughout the SOP for consistency.

f. In page 25 of 64, please clarify the statement, "These compounds do not chromatograph well, **particularly as a column is used."**

g. In Section 8.8.3.1, please change "a 1 or 2 ul injection" to "a 1 ul injection".

h. The data package should include mass spectra, chromatogram, etc.. Please address it in Section 8.10.6.

i. In Section 8.10.6, please specify that library search of up to 20 unknown peaks is required.

j. In Section 8.10.10, please include the MS tuning and calibration information as part of the data package.

k. In Section 9 (QA/QC Requirements), please specify that

matrix spike/matrix spike duplicate (MS/MSD) analysis is required.

l. Equation used to calculate teh standard deviation in page 46 of 64 should be completd.

m. Table A-1 does not include all semivolatile organics that are part of Appendix IX parameters. Please revise it.

n. The title of Table B-5 should be revised per comment 11-e.

o. DFTPP Key Ions and Ion Abundance Criteria should be included in the SOP.

p. Appendix A is not applicable to the project, and should be deleted.

q. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

12. B-13 (GC/MS Analysis of Volatile Organics)

a. In Section 7.6, internal standard, surrogate spike standard, calibration standard solutions, etc., are referenced to SOPs that are not included in Appendix B. Please either provide the missing SOPs or provide the composition and concentration level of each analyte in each standard solution.

Since the concentration of these standard solutions are not provided, we are unable to comment whether the concentration level of these standard added to the sample are appropriate. We will provide specific comments when the missing information are provided.

b. In Section 1.2, please specify the project required detection limit.

c. In Section 8.3, the referenced SOP No. LM-RMA-3022 is not included in the Appendix B. Please provide this missing SOP.

d. In Section 8.4, the sample should be homogenized. See comment XIV.B.19 of this attachment.

e. The Ion Abundance Criteria for BFB is referenced to Table C-1, which is missing from the SOP. Please provide the missing table.

f. Please delete the wording, "and reasonable background substraction or enchancement is acceptable" and the last

paragraph from Section 8.7.1.2.

g. Delete the paragraph, "If samples are not being analyzed for these specific compounds, ...in the analyte set should be documented." from Section 8.7.2 (Initial Calibration) in page 12 of 39.

h. In Section 8.9, a section should be added to address the analysis of relatively low level volatile organics in the presence of high concentration component.

i. The acceptance control limits for surrogate spike and matrix spike recovery should be specified.

j. Equation used for calculating standard deviation should be completed.

k. A target compound list with the project required detection limit should be included in the SOP.

m. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

13. B-14 (Total Suspended Solid)

a. In Section 9, please state that duplicate analysis is required, and specify the acceptance control limit.

14. B-15 (Total Organic Carbon (TOC))

a. This SOP is not to be used for the project and should be deleted form the QAPjP. No other comments are provided.

15. B-16 (Acidity)

a. In Section 9, please state that duplicate analysis is required, and specify the acceptance control limit.

16. B-17 (Specific Gravity)

a. In Section 9, please state that duplicate analysis is required and specify the acceptance control limit.

17. B-18 (Water-Miscible Solvents by Direct Aqueous Injections)

a. In Section 7, please address the following:

- o Preparation, composition, and concentration of standard stock solution.

- o Preparation and concentration of the working standard solutions.

- o preparation and concentration of matrix spike standard solution.

b. In Section 9, please include the analysis of MS/MSD samples, including the frequency, spike level to be used, and control limit.

c. Add a section to address the data package requirements.

18. B-19 (Cyanide by Automated Colorimetric Analysis)

a. Please revise Section 5.2 to read, "The holding time for cyanide is 14 days from day of sample collection.

b. According Section 7.0 and 8.0, the calibration standards do not go through the same distillation process of samples on the assumption that the distillation efficiency is equal to or nearly 100%. This is not fully acceptable. We require that a distilled standard must be analyzed in each batch of 20 samples to asses the distillation efficiency.

c. In Section 9 (QA/QC Requirements), please address the following:

- o Add a subsection to address the requirement of running a distilled mid-range standard, including the acceptance control limit and corrective actions.

- o Please state that matrix spike is required for both water and solid samples.

d. In Section 10.4, the statement, " If the prep blank is more than the detection limit, the detection limit is raised to the blank value." is not acceptable. In such case, the cause of contaminantion should be determined and corrective action taken before the analysis of samples are started. If the cause of this contamination can not be corrected, then results of both the prep blank and sample should be reported. Please address it accordingly.

e. In Section 10.5, the dilution factor should be included for calculation. Please add a sentence to address it.

f. In Section 11.2, if the sample result is less than the detection limit, it should be reported as less than "DL", instead of "ND". Please address it accordingly.

g. We note that a second SOP for Weak Acid Dissociable cyanide is included in this appendix. Please clarify the following:

   o Is it needed for this project? If not, please delete it. Otherwise, comments on the first cyanide SOP apply equally to this SOP.

19. B-20 (Total, Fixed and Volatile Solids, Percent Water)

   a. In Section 8.2 (Preparation), a subsection should be included to address the following:

      o How a homogenious sample will be prepared;

      o How a wet sample (e.g., containing more than 20% of water) be handled/prepared for analysis. Note: A wet sample should first be air-dried overnight and then homogenized. This homogenized sample should be used for the determination of percent water and for other analysis.

   b. In Section 9.1.3, duplicate analysis should be done for the project. Please revise the sentence to reflect this requirement, including frequency of performing duplicate analysis and acceptance control limit.

GROUNDWATER MONITORING PLAN

I. **Section 7 (Monitoring and Sampling)**

A. "Dissolved metals" should be changed to "Total metals".

B. Table 7-3 should be revised per comment II.5 on QAPjP.

II. **Section 8 (Analytical Procedures and Statistical Methods)**

A. The "PQL" should be provided for all target compounds including Appendix IX compounds for both water and mud samples.

QAS NON-SF/NON-RCRA
#5

Texas World
Operations, Inc.

February 6, 1992

SENT VIA FEDERAL EXPRESS
AIRBILL NO. 1920170770

Dr. Cheng-Wen Tsai
United States Environmental Protection Agency - Region 5
Regional Quality Assurance Section (SQ-14J)
77 West Jackson Boulevard
Chicago, Illinois 60604

RE: Chemical Waste Management, Inc., Vickery, Ohio - Response to NODs for LCTP QAPjP Discussed in January 23, 1992 Telephone Call.

Dear Dr. Tsai:

Enclosed for your review is the response to the above referenced NODs. The sections included are the same as were sent with the December 19, 1991 data submittal. This should aid you in comparing this material to that on which you previously commented. Please, do not yet replace any of your existing QAPjP binder sections with this new material.

The enclosed material is for your review and preliminary approval only. Chemical Waste Management believes that acquiring preliminary QAPjP approval from the Quality Assurance Section prior to sending out replacement materials to all persons currently in possession of bound QAPjP copies will improve efficiency and speed plan implementation. Following approval of these modifications, additional copies will be prepared and sent to other involved personnel for updating their binders.

Please review this new material at your earliest convenience so that the core testing plan can proceed. Please contact me at (713) 850-0003 if you have questions or comments.

Sincerely,
TEXAS WORLD OPERATIONS, INC.

James E Sandt

James E. Sandt
Geologist

cc w/o attachments: Richard J. Zdanowicz - USEPA, Chicago
Harlen Gerrish - USEPA, Chicago
Nathan Wiser - USEPA, Chicago
Steve Lonneman - CWM, Vickery
Sheryl Silberman - Texas World, Houston

Texas World
Operations, Inc.

Received on 12-23-91

December 19, 1991

SENT VIA FEDERAL EXPRESS

Dr. Cheng-Wen Tsai
United States Environmental Protection Agency - Region 5
Regional Quality Assurance Section (SQ-14J)
77 West Jackson Boulevard
Chicago, Illinois 60604

RE: Response to NODs for LCTP QAPjP - Chemical Waste Management, Inc., Vickery, Ohio

Dear Dr. Tsai:

At the request of Mr. Steve Lonneman with CWM, enclosed for your review is the response to the above referenced NODs, as per our telephone conversation earlier today. Also enclosed is a guide to replacing sections and pages in the existing QAPjP binders with the new material. Please, do not yet replace any of your existing QAPjP binder sections with this new material.

The enclosed material is for your review and preliminary approval only. Chemical Waste Management believes that acquiring preliminary QAPjP approval from the Quality Assurance Section prior to sending out replacement materials to all persons currently in possession of QAPjP copies will improve efficiency and speed plan implementation. When you have given your approval to the modified plan, additional copies will be prepared and sent to other involved personnel for updating their binders.

Chemical Waste Management believes that all material questions raised about the QAPjP have been addressed. A more detailed Table of Contents will be supplied with the final version of the QAPjP document. Additional chemical analysis for nickel, zinc, lead and chromium in the effluent were not included in parameter lists previously agreed to by CWM and USEPA.

Please review this new material at your earliest convenience so that the core testing plan can proceed. Please contact me at (713) 850-0003 if you have questions or comments.

CWMLCTP\TSAIREVU.CVL

Fax 713/850-7532 P.O. Box 56343 Houston, Texas 77256-6343 713/850-0003

Sincerely,

TEXAS WORLD OPERATIONS, INC.

James E. Sandt
Geologist

cc w/o attachments:
Richard J. Zdanowicz - USEPA, Chicago
Harlen Gerrish - USEPA, Chicago
Jim Paulson - USEPA, Chicago
Steve Lonneman - CWM, Vickery
Sheryl Silberman - Texas World, Houston

CWMLCTP\TSAIREVU.CVL

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:

SQ-14J

MEMORANDUM

DATE: DEC 13 1991

SUBJECT: Review of the Initial Draft Quality Assurance Project Plan - Addendum to the Groundwater Monitoring Plan for the Chemical Waste Management, Inc. in Vickery, Ohio

FROM: George C. Schupp, Chief
Quality Assurance Section

TO: Richard J. Zdanowicz, Chief
Underground Injection Control Section

ATTENTION: Jim Paulson, Project Coordinator

We have reviewed the initial draft, Quality Assurance Project Plan (QAPjP) - addendum to the groundwater monitoring plan (GWMP)- for monitoring well installation and monitoring activities at the Chemical Waste Management (CWM), Inc., which was received by the Quality Assurance Section (QAS) on November 5, 1991 (QAS Log-In No. 55). This subject QAPjP is not acceptable until deficiencies listed in the Attachment are adequately addressed.

Per Jim Paulson's request, comments on the Groundwater Monitoring Plan (GWMP) are limited to sections that were referenced in the subject QAPjP.

Based on our expertise and QA experience, several comments identified in our review of the QAPjP need to be addressed in order to receive formal approval by the Regional Quality Assurance Manager. However, those comments annotated with an asterisk (*) are being provided to you for your review and consideration strictly from our concern to further protect the environment, public health, and safety, or for clarity.

If you have any questions regarding this memo, please contact Cheng-Wen Tsai, of my staff, at 886-6220.

Attachment

ATTACHMENT

QUALITY ASSURANCE PROJECT PLAN

I. TABLE OF CONTENT

A. Please include the page number for all sections and subsections.

II. PROJECT DESCRIPTION

A. In Section 4.3 (Intended Data Usage), please address the usage of data from field measurements that are specified in Table III-1.

B. In Section 5.0 (Target Parameters), please address the following:

1. A parameter list including the required method detection limits should be included in this section.

2. Appendix IX parameters are specified to be tested for certain samples. It is not clear, however, whether it means the whole Appendix IX parameter list or only part of the list. Please clarify it accordingly.

3. In page 12 of 22, please address the following:

   a. "trans-1,2-Dichloroethene" should be changed to "1,2-Dichloroethene (Total)".

   b. "1,3-Dichloropropene" should be changed to "trans-1,3-Dichloro-propene" and "cis-1,3-Dichloropropene".

4. In page 13 of 22, please address the following:

   a. Samples for inorganics should not be field filtered.

   b. "Dissolved metal" should be changed to "Total metal".

   c. Please clarify whether "alkalinity" and "total dissolved carbonate" are both needed. Please clarify it and make any necesary changes in page 13 and 14 of 22.

   d. In page 14, 15 of 22, it is not clear whether the whole Appendix IX paameters will be tested for all rounds of samples. If the answer is "No", then we suggest that it should be done for the first round of samples. The number of Appendix IX parameters to be tested can be reduced only after

the analysis of the first round of samples.

e. In page 16 of 22, the "dissolved metals" should be changed to "total metals", and the footnote of field filtration should be deleted.

5. Table III-1 should be revised for the following:

a. Lab parameter should be separated into several parameter groups (volatile organics, metals, general chemistry, etc.). See the example 1 of this Attachment.

b. Trip blank is not required for parameter/parameter groups other than volatile organics. Please correct it.

c. For Appendix IX parameters, it should also be divided in to different parameter groups per comment II.5.a of this attachment.

6. Table III-2 should be revised per comment II.5 of this attachment.

C. A section should be added to address the geological formation, hydrogeological information of the monitoring site.

III. PROJECT ORGANIZATION AND REPSONSIBILITY

A. Please identify which ENSECO lab is selected for this project. The address of the selected ENSECO laboratory should be provided in this Section.

B. In page 3 of 5, the sentence, "Region V Central Regional Laboratory (CRL) and/or Central District Office (CDO) are responsible for external performance and system audits." should be revised to read, "Region V Central Regional Laboratory (CRL) is responsible for external performance and system audits of ENSECO laboratory, and Region V CRL and/or Central District Office (CDO) are responsible for external performance and system audits of field activities."

C. In Table IV-1, please address the following:

1. For external audits of field procedures, please add "Region V CRL/CDO".

2. For external audits of lab procedures, please delete "/CDO".

IV. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION ACCURACY, COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY

A. For assessing precision, the percent relative difference (RPD) of MS/MSD analysis is used for organic analysis, and RPD of duplicate analysis is used for inorganic analysis. Please revise Section 1.2 to reflect this requirement.

B. The acceptance control limits for accuracy, precision and completeness that are required for the project should be specified.

C. For representativeness, please add a bullet to state that sample will be analyzed within the allowed holding time using the approved methods.

V. SAMPLING PROCEDURE

A. A summary table of sample containers, preservation, technical holding time requirements should be provided in this section. See also comments on Appendix A of this attachment.

B. For each sample matrix, please add a statement to address the collection of field duplicate samples.

C. Samples, including make up water and ground water, for both metals and other inorganic parameters should not be field filtered.

D. For drilling mud, please state whether the mud samples will be collected and analyzed as a whole sample (supernatant plus mud) or else.

E. A bound field logbook should be used to document all field activities. Entries to the logbook, as a minimum, should include the following:

- o Date/time of sampling;
- o Location;
- o Sampler;
- o Sample handling, preservation and filtration;
- o General observation;
- o Weather condition;
- o Sample ID number, etc.

Please address them in page 17 of 17 (Section 9).

F. Table VI-1 and VI-2 should be revised per comments II.5 and II.6 of this attachment.

G. In page 15 of 17, the first sentence of the first paragraph is incorrect. Trip blanks, field blanks and field duplicate samples are used to check field sampling procedures, not the performance of the laboratory. Please address it accordingly.

H. In Section 8.1 (Trip Blanks), the statement regarding the frequency of preparing trip blanks and the information provided by the results of trip blank analysis are incorrect. Please correc the following:

1. Trip blank sample (for volatile organics only), which consists of two 40-ml vials, should be placed in each shipping cooler of VOA samples.

2. The trip blank samples are used to check for any corss-contamination as a results of diffusion through the septa during sample shipment and storage. Please correct.

I. In Section 8.2 (Field Blanks), please address the following:

1. The field blank should be prepared by filling sample bottles with deionized water that has been routed through sampling device, including filter if field filtration is performed.

2. The frequency of collecting field blank sample, which is one per group of 10 or fewer investigative samples collected, should be specified.

J. In Section 8.3, the frequency of collecting field duplicate samples is one per group of 10 or fewer investigative samples of same matrix. Please address it accordingly.

VI. SAMPLE CUSTODY

A. See comments on Appendix A for field and laboratory sample custody procedures.

B. The evidence file should also include correspondences pertaining to this project.

VII. ANALYTICAL PROCEDURES

A. Please change "Dissolved metals" in pages 2 of 11 and 11 of 11 to "Total metals".

B. SOPs for field measurements using instruments such as OVA, HNu, etc. should be provided.

C. A parameter list including the required method detection limits or quantitation limits shouldbe provided.

VIII. INTERNAL QUALITY CONTROL CHECK

A. See comment V.H of this attachment for the usage of trip blank data. Please address it in Section 1.3.1 (page 2 of 14).

B. See comment V.I of this attachment on the frequency of collecting field duplicate samples, and address it in Section 1.2 (page 1 of 14).

C. See comment V.I of this Attachment on the procedure of preparing field blank and the frequency, and address it properly in Section 1.3.2 (page 2 of 14).

D. For laboratory analysis, internal QC checks are referenced to Appendix C-1. This is not acceptable because Appendix C-1 is nothing but generic statements. We suggest that Appendix C-1 be deleted, and reference the laboratory internal QC checks to each individual SOP.

IX. DATA REDUCTION AND REPORTING

A. The title of this section should be "Data Reduction, Validation, and Reporting".

B. Please add a section to address the data validation. The description should include the procedures and criteria used for validating data.

C. For the reduction of lab data, please reference them to the SOPs.

X. PERFORMANCE AND SYSTEM AUDITS

A. Please add a section to address the interanl and external audits of laboratory.

XI. PREVENTATIVE MAINTENANCE

A. For maintenance of laboratory instruments, a maintenance schedule for routine preventative maintenance should be provided.

XII. CORRECTIVE ACTIONS

A. The description of corrective actions should cover each level of data generation/review.

1. Field Measurements and Sample collection:

   a. Chain of command in initiation, development, approval and implementation of corrective actions on sample collection should be addressed.

   b. For field measurements, the corrective actions on each level of data generation and review should be addressed.

2. Laboratory Analysis:

   a. Chain of command in initiation, development, approval and implementation of corrective actions at each level of data collection/review should be addressed.

XIII. QUALITY ASSURANCE REPORT TO MANAGEMENT

A. U.S. EPA should also receive QA reports because EPA is part of the management team for the project.

XIV. APPENDICES

A. **Appendix A**

1. A-1 (Filtration)

   a. Samples for this project should not be filtered. Please address it.

   b. The first bullet in page 67 which stated that filtration should be done within 2 hours of sample collection is not acceptable. The sample filtration, if required, should be performed within 20 minutes of sample collection.

2. A-3 (Sample Bottles)

   a. A section should be added to address the procedures for cleaning/preparing sample bottles. NOTE: If sample bottles are provided by the laboratory, the SOP for sample bottle preparation that is used by the laboratory should be attached to the QAPjP.

   b. In page 70, it is stated, "A listing of preservatives by analysis is included in the Appendix (A13-A16) for reference only.". This statement is incorrect, and should be rephrased to be "A listing of preservatives by analysis is included in pages A13-A16 of the appendix A-3 for reference only.". See also comment on Appendix A-4.

3. A-4

   a. Water Samples (make-up water and groundwater) for the analysis of volatile organics should be preserved with HCl to pH < 2 and cooled to 4°C.

   b. Footnote 5 in page A17 should be revised as follows:

      o Retaining only the first two sentences, and delete the rest of the paragraph.

      o Add a sentence to state the holding time started at the day of sample collection.

   c. Sample for nitrite or nitrate alone should not be preserved with H2SO4, and the holding time should be 48 hours, instead of 2 weeks.

   d. Sample for the analysis of volatile organics should be preserved with HCL to pH<2 **and** cooled to 4°C.

   e. The sample preservation procedure in page A19 is not acceptable. samples bottle should not be reopened for checking the pH using capillary tube or pH paper, which will result in loss of volatile compounds or contaminating the sample.

4. A-5 (Field Custody Procedure)

   a. A section should be added to address the sample numbering system. This is necessary for the purpose of tracking sample custody.

5. A-7 (Sample Custody Procedure of ENSECO Laboratory)

   a. The chain-of-custody procedure for laboratory analysis should include sample tracking during sample storage, sample preparation (digestion/extraction), and sample analysis.

   b. The referenced Figure 7-2 is missing and should be provided in the next QAPjP submisstion.

6. A-8 (Calibration Procedures and Frequency)

   a. The tuning criteria for both BFB and DFTPP should be included in this section.

7. A-9 (Calibration Procedures and Frequency)

   a. This is nothing but generic statement. We suggest that this appendix be deleted, and reference all calibration procedures and frequency to each individual SOP.

B. **Appendix B (Standard Operating Procedures)**

1. B-1 (Total Dissolved Solids (TDS))

   a. In Section 5, please address the following:

      o A 100 ml sample may not be adequate. We suggest that a minimum of 250 ml sample should be collected.

      o In Section 5.1, it stated that sample may or may not be filtered in the field. This statement is not acceptable. Instead, it should state whether sample will be filtered in field or in the lab. If sample is to be filtered in the lab, then an allowed time frame (e.g., at the time lab receives the sample) should be specified.

   b. In Section 8.1 (Preparation), please state that samples will be filtered as soon as lab receives them.

      NOTE: It is necessary to filter the sample to remove any suspended particulate as soon as possible. Otherwise, some dissolved solids may reprecipitate and lost with the suspended solid through filtration.

   c. Section 8.2.1 should be placed under Section 8.1.

   d. In Section 11.2, results below the reporting limits should be reported as "< MDL", instead of "ND" which was not defined.

2. B-3 (Metal Analysis by ICP)

   a. A section should be added to address the sample preparation. Otherwise, the appropriate SOP for sample preparation should be attached.

   b. Please specify the concentration of each metal in the calibration standard solutions.

   c. In Section 9.0 (QA/QC Requirements), please address the following:

- o The level of matrix spike to be used.
- o the acceptance control limits for the analysis of QC samples.

d. The MDL and/or ENSECO reporting limits for the following metals appear to be high:

- o Thallium;
- o Arsenic;
- o Selenium.

Please correct them.

e. The interelement correction for ICP is not addressed. Please provide the composition and concentration of the standard solution used for this purpose.

3. B-4 (GFAA Analysis)

a. Please specify the actual dynamic linear range for each analyte.

b. In Section 7, please address the preparation of stock standard solution and three level of working standard solutions including their concentrations.

c. In Section 9, please state that duplicate analysis and matrix spike analysis are required at frequency of one per batch of 20 samples prepared/analyzed, and the acceptance control limits are $\pm$ 25% RPD and 90-110% respectively.

4. B-5 (Mercury Analysis)

a. Please specify the actual linear range of the method.

b. In Section 7, please address the preparation of stock standard solution and working standard solutions including the concentration.

NOTE: A minimum of three level of standard solutions should be used for initial calibration to define the working linear range.

c. In Section 9.1.2, the concentration of standard solutions to be used for calibration are too high. Please revise them to 0.05 ug, 1 ug, 2 ug, and 4 ug.

d. In Section 9.5, please state that duplicate analysis and matrix spike analysis are required at a frequency of one per batch of 20 samples prepared/analyzed, and the acceptance control limits are ± 25% RPD and 90-110% respectively.

e. A section should be added to address the data package requirements. NEED Appendix C-3

NOT ADDressed in C-3

5. B-6 (Anion Analysis by Ion Analysis)

a. In Section 9 (QA/QC Requirements), please address the following:

- o Please state in 9.1.4 that duplicate analysis is required at a frequency of one per batch of 20 samples analyzed, and the acceptance control limit should be ± 25%.
- o Please state in 9.1.5 that matrix spike anaysis is required at a frequency of one per batch of 20 samples prepared/analyzed, and the percent recovery should be 90-110%.

b. A section should be added to address the data package requirements. C-3

NOT addressed in C-3

6. B-7 (Ammonia, Nitrate+Nitrite)

a. In Section 9.1.4, it stated that the spiking concentration is 1 mg/L. Please clarify what does it mean (e.g., the final concentration in term of N in the sample, etc.).

b. In Section 9.2, please include the acceptance control limits for blanks. C-1

C-1 does not provide explicit instructions

c. For ammonia analysis, please specify whether distillation will be used. NOTE: If distillation is used for sample, the calibration standards should be distilled as well. Otherwise, a distilled mid-range standard should be analyzed along with each batch of 20 samples to assess the efficiency of distillation.

d. If copper/cadmium column is used, the calibration standards should be treated the same way as sample.

7. B-8 (Total Recoverable Phenols)

a. Since the calibration standards are not distilled with

samples, we require that, for each batch of 20 samples, a mid-range distilled standard be prepared and analyzed with samples to assess the distillation efficiency.

b. In Section 9 (QA/QC REquirements), please address the following:

- State in 9.1.4 that duplicate analysis will be done at a frequency of one per batch of 20 samples, and the %RPD should be ±25% in 9.2.5.
- State in 9.1.5 that matrix spike is required at a frequency of one per batch of 20 samples prepared/ analyzed.

c. A section should be added to address the data package requirements.

NOT ADDRESSED ADEQ. IN C-3

C-3

8. B-9 (Phenoxyacid Herbicides)

a. In Section 1.4, please specify the dynamic linear range for each target compounds.

b. In Section 6, please identify which is the primary column, and which is the secondary (or confirmatory) column.

c. In Section 7 (Reagents and Standards), please address the following:

- Preparation of secodary standard solution and its concentration;
- The preparation and concentration of 5 level of calibration standard solutions.
- Preparation and concentration of surrogate spike compound solution;
- Preparation and concentration of matrix spike solution.
- Concentration of continuing claibration check standard.

d. A section should be added to address the data package requirements.

e. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

check again

9. B-10 (Organophosphorous Pesticides)

   a. In Section 6, please identify which is the primary column, and which is the secondary (or confirmatory) column.

   b. In Section 7 (Reagents and Standards), please address the following:

      - o The concentration of the primary standard solution;
      - o Preparation of secodary standard solution and its concentration;
      - o The preparation and concentration of 5 level of calibration standard solutions.
      - o Preparation and concentration of surrogate spike compound solution;
      - o Preparation and concentration of matrix spike solution.
      - o Concentration of continuing claibration check standard.

   c. In Section 8.2.4 and 8.2.5, please specify the amount of surrogate spike solution and matrix spike solution to be used for spiking.

   d. In Section 10 (QA/QC Requirements), please address the following:

      - o A section should be added to address the criteria for qualitative identification of the target compounds.
      - o Please address the frequency of continuing calibration check and the frequency.
      - o Please revise Section 10.1.2 to state that matrix spike and matrix spike duplicate analysis are required at a frequency of one per group of 20 investigative samples.

   e. A section should be added to address the data package requirements.

   f. Please provide a summary table of target compounds and their retention time per the instrument conditionsused.

10. B-11 (Analysis of Organochlorine Pesticids and PCBs)

   a. In Section 2.2, more than one target compound list with

different reporting limtis is included. Please provide only one table containing all target compounds with the required quantitation limits.

b. In Section 7 (Reagents and Standards), please include the calibration standard mixture (compositions and concentrations), surrogate spike standard solution, matrix spike standard solutions, etc.

NOT ADDRESSED

NOTE: Tetrachloro-m-xylene and decachlorobiphenyl should be used as surrogate.

c. In Section 8.2, please specify the amount of surrogate spike compounds, and matrix spike compounds to be used for spiking.

d. GPC and/or Acid cleanup is required for soil samples.

e. Section 10 (QA/QC requirements) should discuss the requirement of matrix spike analysis, including the compounds to be used for spike and the spike level used.

Partial

f. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

11. B-12 (GC/MS Analysis of Semivolatile Organics)

a. In Section 1.2, please address the following:

NOT ADDRESSED

- The statement, "If a sample contains a high concentration of target compounds or a large amount of interfering material, it will be diluted prior to analysis." is not acceptable. Sample contains some target compound(s) at a relatively high concentration should be analyzed twice - one without dilution to determine the low concentration components, and one with dilution to determine the high concentration components. Results of both analyses be reported.

- Appendix A, B, thru F are referenced in this SOP; however, not all of these referenced appendices are included in the SOPs. Please provide these missing appendices.

b. Please specify the solvent system to be used for solid samples.

c. Sections 7.6 thru 7.10 reference the surrogate spike standard, matrix spike standard, internal standard

solutions, etc., to Appendix B, which is not exist. Please reference these standard solutions to each individual table.

d. For aqueous sample preparation, both separatory Funnel extraction and continuous extraction are listed in the SOP. Please specify which extraction method will be used.

e. In Section 8.8.2 (Initial Calibration), please address the following:

Either run a 10ug/ml Std or raise reporting limits to 20 ug/ml or higher

- o It is stated that initial calibration will be done with calibration standards at concentration of 20, 50, 80, 120 and 160 ug/ml. Please change it to 10, 20, 40, 80 and 160 ug/ml.

- o Delete the paragraph, "If samples are not being analyzed for these specific compounds, ...in the analyte set should be documented.".

NOT addressed

- o In Section 8.8.2.1, please change "a 1-2 ul injection" to "a 1 ul injection".

- o In Section 8.8.2.4, it states that the concentration of intenal standard is 40 ug/ml, acid surrogate compounds is 100 ug/ml, and base/neutral surrogate compounds is 50 ug/ml. This is inconsistent with the concentrations actually adds to sample based on proposed volume (e.g., 1 ml) and the concentration of working standard solution (Table B-1). Please correct them throughout the SOP for consistency.

f. In page 25 of 64, please clarify the statement, "These compounds do not chromatograph well, **particularly as a column is used."**

g. In Section 8.8.3.1, please change "a 1 or 2 ul injection" to "a 1 ul injection".

NOT ADDRESSED

h. The data package should include mass spectra, chromatogram, etc.. Please address it in Section 8.10.6.

i. In Section 8.10.6, please specify that library search of up to 20 unknown peaks is required.

NOT ADDRESSED

j. In Section 8.10.10, please include the MS tuning and calibration information as part of the data package.

k. In Section 9 (QA/QC Requirements), please specify that

matrix spike/matrix spike duplicate (MS/MSD) analysis is required.

l. Equation used to calculate teh standard deviation in page 46 of 64 should be completd.

m. Table A-1 does not include all semivolatile organics that are part of Appendix IX parameters. Please revise it.

n. The title of Table B-5 should be revised per comment 11-e.

o. DFTPP Key Ions and Ion Abundance Criteria should be included in the SOP.

p. Appendix A is not applicable to the project, and should be deleted.

NOT ADDRESSED

q. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

12. B-13 (GC/MS Analysis of Volatile Organics)

NOT completely addressed

a. In Section 7.6, internal standard, surrogate spike standard, calibration standard solutions, etc., are referenced to SOPs that are not included in Appendix B. Please either provide the missing SOPs or provide the composition and concentration level of each analyte in each standard solution.

Since the concentration of these standard solutions are not provided, we are unable to comment whether the concentration level of these standard added to the sample are appropriate. We will provide specific comments when the missing information are provided.

b. In Section 1.2, please specify the project required detection limit.

c. In Section 8.3, the referenced SOP No. LM-RMA-3022 is not included in the Appendix B. Please provide this missing SOP.

d. In Section 8.4, the sample should be homogenized. See comment XIV.B.19 of this attachment.

e. The Ion Abundance Criteria for BFB is referenced to Table C-1, which is missing from the SOP. Please provide the missing table.

f. Please delete the wording, "and reasonable background substraction or enchancement is acceptable" and the last

paragraph from Section 8.7.1.2.

g. Delete the paragraph, "If samples are not being analyzed for these specific compounds, ...in the analyte set should be documented." from Section 8.7.2 (Initial Calibration) in page 12 of 39.

h. In Section 8.9, a section should be added to address the analysis of relatively low level volatile organics in the presence of high concentration component.

i. The acceptance control limits for surrogate spike and matrix spike recovery should be specified.

j. Equation used for calculating standard deviation should be completed.

k. A target compound list with the project required detection limit should be included in the SOP.

m. Please provide a summary table of target compounds and their retention time per the instrument conditions used.

13. B-14 (Total Suspended Solid)

a. In Section 9, please state that duplicate analysis is required, and specify the acceptance control limit.

14. B-15 (Total Organic Carbon (TOC))

a. This SOP is not to be used for the project and should be deleted form the QAPjP. No other comments are provided.

15. B-16 (Acidity)

a. In Section 9, please state that duplicate analysis is required, and specify the acceptance control limit.

16. B-17 (Specific Gravity)

a. In Section 9, please state that duplicate analysis is required and specify the acceptance control limit.

17. B-18 (Water-Miscible Solvents by Direct Aqueous Injections)

a. In Section 7, please address the following:

o Preparation, composition, and concentration of standard stock solution.

- o Preparation and concentration of the working standard solutions.
- o preparation and concentration of matrix spike standard solution.

b. In Section 9, please include the analysis of MS/MSD samples, including the frequency, spike level to be used, and control limit.

c. Add a section to address the data package requirements.

18. B-19 (Cyanide by Automated Colorimetric Analysis)

a. Please revise Section 5.2 to read, "The holding time for cyanide is 14 days from day of sample collection.

b. According Section 7.0 and 8.0, the calibration standards do not go through the same distillation process of samples on the assumption that the distillation efficiency is equal to or nearly 100%. This is not fully acceptable. We require that a distilled standard must be analyzed in each batch of 20 samples to asses the distillation efficiency.

c. In Section 9 (QA/QC Requirements), please address the following:

- o Add a subsection to address the requirement of running a distilled mid-range standard, including the acceptance control limit and corrective actions.
- o Please state that matrix spike is required for both water and solid samples.

d. In Section 10.4, the statement, " If the prep blank is more than the detection limit, the detection limit is raised to the blank value." is not acceptable. In such case, the cause of contaminantion should be determined and corrective action taken before the analysis of samples are started. If the cause of this contamination can not be corrected, then results of both the prep blank and sample should be reported. Please address it accordingly.

e. In Section 10.5, the dilution factor should be included for calculation. Please add a sentence to address it.

f. In Section 11.2, if the sample result is less than the detection limit, it should be reported as less than "DL", instead of "ND". Please address it accordingly.

g. We note that a second SOP for Weak Acid Dissociable cyanide is included in this appendix. Please clarify the following:

   o Is it needed for this project? If not, please delete it. Otherwise, comments on the first cyanide SOP apply equally to this SOP.

19. B-20 (Total, Fixed and Volatile Solids, Percent Water)

   a. In Section 8.2 (Preparation), a subsection should be included to address the following:

      o How a homogenious sample will be prepared;

      o How a wet sample (e.g., containing more than 20% of water) be handled/prepared for analysis. Note: A wet sample should first be air-dried overnight and then homogenized. This homogenized sample should be used for the determination of percent water and for other analysis.

   b. In Section 9.1.3, duplicate analysis should be done for the project. Please revise the sentence to reflect this requirement, including frequency of performing duplicate analysis and acceptance control limit.

Specify control limits

GROUNDWATER MONITORING PLAN

I. **Section 7 (Monitoring and Sampling)**

A. "Dissolved metals" should be changed to "Total metals".

B. Table 7-3 should be revised per comment II.5 on QAPjP.

II. **Section 8 (Analytical Procedures and Statistical Methods)**

A. The "PQL" should be provided for all target compounds including Appendix IX compounds for both water and mud samples.

5SMQA

MEMORANDUM

DATE: OCT 23 1991

SUBJECT: Supplemental comments to the First Draft Quality Assurance Project Plan for Agency's Oversight on PRP's Remedial Investigation/ Feasibility Study of the Operable Unit #3 at the DOE Mound Plant Site in Miamisburg, Ohio

FROM: George C. Schupp, Chief
Quality Assurance Section

TO: Donald Bruce, Chief
Ohio/Minnesota Section

ATTENTION: Diana Mally, Remedial Project Manager

This memo documents the Central Regional Laboratory's (CRL's) concerns on the acceptability of samples containing radioative materials to the CLP labs, and procedures to deal with these type of samples. According to CRL, only samples with radioactivity counts lower than a certain level can be sent through the Routine Analytical Service (RAS) requests to CLP laboratories for analysis. **NOTE: Only one laboratory is known to accept organic radioactive samples and one inorganic laboratory may be able to accept low level radioactive samples.** If the radioactivity of samples exceeds this level, then these samples would have to be sent through the Special Analytical Service (SAS) requests to CLP laboratories. To assist CRL in making the proper arrangements, the radioactivity level of each sample must be known. Consequently, we suggest the following:

1. Donohue should scout out the area of sampling **as soon as possible** to determine what level of radiation exists, prior to collecting samples.

2. Donohue should contact the RSCC approximately two weeks from sampling so that the capacity of the organic and inorganic laboratories can be assessed and SMO will be informed that the samples are planned. If radiation levels are known at that time, SMO will inform the labs to determine whether they can accept the samples, and whether they will need to return the samples to the site after analysis. It will be determined at the time whether other (non-CLP included) labs will need to be solicited under an SAS for this work.

3. Each sample should be field screened with a Geiger counter to determine the level of radioactive contamination. The radioactivity level of each sample should be recorded in the field logbook, and a copy of the information should be shipped along with the samples to the CLP laboratories regardless whether they are processed through RAS or SAS requests.

4. Proper shipping requirements should be sought from Federal Express in order to comply with DOT regulations.

5. Based on the screening result, separate samples into two groups, one to be sent by RAS request, and one by SAS.

The field screening procedure, including the radioactivity level used to determine the procedure for handling the sample, should be addressed in the Field Sampling Plan (FSP). A Standard Operating Procedure (SOP) for operating the Geiger Counter for field screening purpose should also be attached to the next revision of QAPjP.

If you have any questions regarding this memo, please contact Cheng-Wen Tsai, of my staff, at 886-6220.

cc: Charles Elly, CRL
Kaushal Khanna, TSU

To: Permit Unit (Jim P)

Chemical Waste Management, Inc.

3956 State Route 412
Kirkersville, Ohio 43464
419/547-7791

September 24, 1991

Via Federal Express
Airbill No. 0997930813

Mr. Richard J. Zdanowicz, Chief
Underground Injection Control Section
United States Environmental Protection Agency
Region V
230 South Dearborn St., 5WD-TUB-9
Chicago, Illinois 60604

Re: Revised Quality Assurance Project Plan (QAPP) for the Laboratory Core Testing Plan

Dear Mr. Zdanowicz:

Enclosed please find two copies of the revised QAPP for the LCTP. This QAPP has been modified to incorporate all required elements as detailed in your letter dated August 19, 1991. I trust that satisfactory responses to all of your concerns will lead to approval of the LCTP.

If you have any questions, please contact Mr. Steve Lonneman or myself at 419-547-7791.

Sincerely yours,

CHEMICAL WASTE MANAGEMENT, INC.

Fred G. Nicar
General Manager

Attachments

cc w/attachments: Bob Heitman
Steve Lonneman
Sheryl Silberman, TWO
Agency Correspondence File

cc w/o attachments: Mary Lou Hodnett, OEPA
Greig Siedor
Jay Skabo
George Vander Velde

DISTRIBUTION SHEET FOR RCRA QAPP

DATE ASSIGNED: 9/26/91 ; DATE DUE : 10/17/91

QAPP RECEIVED ON 9/26/91, QAS LOG-IN NO. 44

SITE NAME : Chem. Waste Mgmt. Addendum to Lab, STATE: OH.
Core boring

SITE IDENTIFICATION NO. : _____

PROJECT TYPE : [X] RCRA PERMITTING; [ ] RCRA ENFORCEMENT.

REVISION NO. : [ ] FIRST DRAFT; [ ] FIRST REVISION; [X] 2nd REVISION

PRIORITY : [X] REGULAR - [ ] 21 DAYS;

[ ] HIGH PRIORITY - _____ DAYS

[ ] EXPEDITED REVIEW REQUESTED FOR _____ DAYS

PROJECT COORDINATOR : _____ ; TELEPHONE _____

PERMIT WRITER : Jim Paulson ; TELEPHONE 6-1497

1. FOR COMMENTS:

[ ] _____, PERMIT WRITER ; [ ] _____, PROJECT COORDINATOR
{state}/{state} SECTION {state}/{state} SECTION

2. FOR APPROVAL:

[X] KARL E. BREMER CHIEF
RCRA PERMITTING BRANCH

[ ] LAURA IODISIO, ACTING CHIEF
RCRA ENFORCEMENT BRANCH

QAS REVIEWERS : 1. Tsai , 2. _____

CRL REVIEW : [ ] YES; [X] NO

FORM CWI-R1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

5SMQA
REPLY TO ATTENTION OF:

MEMORANDUM

DATE: JUL 25 1991

SUBJECT: Review of the First Revision Quality Assurance Project Plan - Addendum to the Laboratory Core Testing Plan for the Chemical Waste Management, Inc. in Vickery, Ohio

FROM: George C. Schupp, Chief
Quality Assurance Section Kevin B. Bolger for

TO: Richard J. Zdanowicz, Chief
Underground Injection Control Section

ATTENTION: Jim Paulson, Project Coordinator

We have reviewed the first revision, Quality Assurance Project Plan (QAPjP) - addendum to the laboratory core testing plan - for core testing activities at the Chemical Waste Management (CWM) Inc., which was received by the Quality Assurance Section (QAS) on June 11, 1991 (QAS Log-In No. 21). This subject QAPjP was reviewed in conjunction with our April 30, 1991 memo. We noted that the quality of this QAPjP had been greatly improved; however, this subject QAPjP remains unapprovable because 1) Several major deficiencies mentioned in our April 30, 1991 memo were not adequately addressed; 2) The newly added NET Standard Operating Procedures contain several deficiencies that need to be addressed. We will recommend this subject QAPjP for approval when deficiencies listed in this memo are adequately addressed.

Our comments on the current draft QAPjP are summarized as follows:

I. TABLE OF CONTENT

The table of content should be revised to include the following:

X A. The page number for each individual section and subsection.

X B. List of tables, figures and Appendices that are included in the QAPjP.

II. PROJECT DESCRIPTION

The following should be properly addressed:

A. The parameter list that contains the parameters to be tested as well as the required detection limits are provided in page 9 and 10 of 11. However, there are discrepancies between page 9 and 10. Please clarify the following:

what is the purpose of adding it

1. Why the nickel, zinc, lead and chromium, which are the components of the synthesized fluid, are not part of the parameters to be tested for the effluent fluid? Please clarify and revise the table accordingly.

2. The detection limit for sulfate in page 9 and 10 are 2.5 mg/L and 2.0 mg/L respectively. Please revise it so they are consistent.

3. In page 10 of 11, both sulfate (SO_4) and dissolved sulfate are mentioned. Are they both needed? If the answer is yes, then what will be the difference between these two? Please clarify it, and revise the text accordingly.

B. In the current draft, the required level of Data Quality Objectives (DQOs) were referred to the Standard Operating Procedures. However, none of these SOPs provide the information. Please provide a summary table and insert it in this section. Please use the attached example as reference.

III. PROJECT ORGANIZATION AND RESPONSIBILITY

A. In page 2 of 3, please add a new paragraph to state, "The Texas World Operation is responsible for internal Performance and System audits of both sample collection and Laboratory analysis. U.S. EPA Region V Central Regional Laboratory (CRL) and/or Central District Office (CDO) are responsible for external performance and system audits."

IV. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION ACCURACY, COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY

Please address the following:

A. Define the terms of precision, accuracy, completeness, representativeness, and comparability, and identify the approaches to be used to assess them for the project.

check the SOP for X that - function

B. The acceptance control limits for precision, accuracy, completeness, etc. were referred to SOPs. However, most of the SOPs fail to address them properly. See also comments on SOPs.

C. Describe the field QA efforts, which include the collections of quality control samples, to be implemented. Please describe the the type of QC samples to be collected and the frequency of collection.

V. SAMPLING PROCEDURE

Please address the following:

A. A summary table for sample container, preservation, and holding time requirements should be included.

B. In page 4 of 5, **dissolved zinc, lead, nickel and chromium** should be included as part of parameters to be tested, along with other metals such as aluminum, iron, etc., for **the representative blank acids.**

C. In page 5 of 5, **dissolved zinc, lead, nickel and chromium** should be included as part of parameters to be tested, along with other metals such as aluminum, iron, etc., for **the effluent.**

VI. SAMPLE CUSTODY

A. Chain-of-custody for laboratory analysis

The description should include procedures for sample receiving, sample log-in, storage, sample tracking during sample preparation and analysis. Please provide the procedure for sample receving and log-in, and the forms used for sample tracking during the laboratory analyses (sample preparation and analysis).

VIII. CALIBRATION PROCEDURE AND FREQUENCY

A. Since some revised SOPs (i.e., X-Ray Refractory Analysis) were not included, we reserved the right to comment on this QAPjP element in next submission.

IX. ANALYTICAL PROCEDURES

A. Standard Operating Procedures 1.0

Steps 3, 5 and 12 should be revised to read as follows:

1. Step 3, "**Slowly** add 3,390 grams of 37% HCl and agitate with a paddle stirrer until it is completely **mixed.**"

2. Step 5, "**Slowly** add 10,160 additional grams of 97% H_2SO_4 and agitate with a paddle stirrer until it is complete **mixed.**"

3. Step 12, "**Allow the resulting solution to cool to room temperature,** add deionized water to the 200 liter mark volume and mix thoroughly."

B. Standard Operating Procedures 1.2

Step 3, 4 and 5 should be revised per comments of SOP 1.0.

C. NET Standard Operating Procedures for TOC

This SOP is not complete and should be revised to provide the following:

1. The detailed analytical procedure should be completed.

2. The SOP should include the method detection limit as well as the working linear range.

NOTE: If NET laboratory has run the method detection study on a annual bais, then these data should be included in the SOP.

3. Please provide the equation to be used for calculating the results.

4. Please add a section to address the data reporting requirements. The description should include the reporting unit as well as what the data package will consist of .

D. NET Standard Operating Procedure for Sulfate

The following should be include in the SOP:

1. The method detection limit should be specified.

2. The working linear range of this method should also be specified.

3. Correction for sample color and turbidity arementioned in Section 6.2.4; however, no further information on how the correction will be done on the analytical results is provided. Please state how the correction will be done.

4. Please add a section to address the data reporting requirements. The description should include the reporting unit as well as what the data package will consist of .

E. NET Standard Operating Procedure for Acidity

This SOP is not complete. Please provide a complete copy that contains information on "Summary of Method", "Appratus", "Reagents", "Standards", "Data Reporting" and "Quality Controls".

NOTE: Quality control requirements provided in Section 7 are not for the determination of acidity, and should be replaced with the appropriate QC for acidity.

F. NET Standard Operating Procedure for Total Solids

1. The qulaity control requirement provided in Section 7 is not applicable for the determination of total solids. Please revise it.

2. Please add a section to address the data reporting requirements. The description should include the reporting unit as well as what the data package will consist of .

G. NET Standard Operating Procedure for Total Suspended Solids

1. See Comments on SOP for Total Solids.

H. NET Standard Operating Procedure for Chloride

1. Please specify the method detection limit.

2. Section 7 (quality control) should be replaced with description that are applicable to the determination of chloride.

3. Please add a section to address the data reporting requirements. The description should include the reporting unit as well as what the data package will consist of .

I. NET Standard Operating Procedure for Alkalinity

1. Section 7 (quality control) should be replaced with description that are applicable to the determination of alkalinity.

2. Please add a section to address the data reporting requirements. The description should include the reporting unit as well as what the data package will consist of .

J. NET Standard Operating Procedure for Metals by ICAP.

This SOP is rather generic. Please provide the following:

1. The procedure for sample preparation.

2. The preparation of calibration standard solutions, including the concentrations. Note: A minimum of three level of standard solution, excluding the blank, should be used for initial calibration.

3. Provide detailed calibration procedure.

4. For Quality Control, please address the following:

a. Concentrations of the Initial calibration verification standard and the continuing calibration verification standard to be used.

b. Preparation of method blank.

c. The concentration of the standard solution to be used for matrix spike.

d. The matrix spike level to be used.

NOTE: The level of spike should be at least 35% above the concentration of sample.

5. Please add a section to address the data reporting requirements. The description should include the reporting unit as well as what the data package will consist of .

K. NET Standard Operating Procedure for Acid Digestion for Metals on ICP and FLAA

1. In this SOP, the preparation of method blank, matrix spike, etc. should be properly addressed.

2. For matrix spike, the spike level to be used and the frequency of preparing the matrix spike should be specified.

3. Since this SOP documents only the procedure of sample digestion, sections such as analytical procedure and method detection limits, etc., should be deleted.

L. X-Ray Diffraction (SOP 2.2)

Two items mentioned in our April 19, 1991 memo were still not addressed. Please address the following:

1. Describe how the analytical results will be reported.

2. Describe, in details, the procedure used for sample preparation.

M. Standard Operating Procedure 2.4

This SOP was not revised per QAS April 19, 1991 memo. Please address the following:

1. Describe the procedure to be used for preparing the composite effluents.

2. Specify the sample containers (container type, size, etc) to be used.

X. INTERNAL QUALITY CONTROL CHECK

A. Our previous comments on this QAPjP element were not addressed. Please address the following:

1. For Sampling Activity

The description for sampling activity should include the colleciton of QC sampes such as field blanks, field duplicate, etc.

2. For Laboratory Analysis

The internal QC checks for laboratory analysis should include the analyses of the following:

a. Method blank;

b. Reagent blanks;

c. Preparation (digestion/distillation) blanks;

d. duplicate analysis (inorganic analysis only);

e. Matrix spike/matrix spike duplicate samples (organic analysis only);

f. calibrations (initial calibration and continuing calibration check), etc.

NOTE: The acceptance control limit for each analysis should be specified.

XI. DATA REDUCTION, VALIDATION, AND REPORTING

A. Data Reduction

For chemical analysis, the procedures to be used to reduce the instrument printouts to the final reporting values were referred to the SOPs; however, not all of the SOPs provide the information. We suggest that the following should be done:

1. Revise each SOPs to include the procedure for data reduction. and

2. Refernce the procedure of data reduction for each analysis to the appropriate SOP, including the SOP I.D. number.

B. Data Validation

The description provided under this heading contains only the data presentation. The procedures and criteria to be used for data validation were not specified. Please address/reference them accordingly.

C. Data Reporting

This deficiency was not addressed. Please specify the content of the data package the laboratory is required to provide for the project.

If you have any questions regarding this memorandum, please contact Cheng-Wen Tsai, Chemist, of my staff at 886-6220.

Attachment

cc: Jessie Chiu, WD

********* EXAMPLE NO. 2 *********

Laboratory Parameter	Matrix				
	OU 3 Soil/Sediment	OU 9 Water	OU 9 Soil/Sediment	OU 9 Residential Wells	Air
Routine Analytical Services:					
TCL Volatiles	IV	IV	IV		
TCL Semivolatiles	IV	IV	IV		
TCL Pesticide/PCBs	IV	IV	IV		
TAL Inorganic	IV	IV	IV		
Special Analytical Services:					
TCL Volatiles				V	V
TCL Semivolatiles				V	V
TCL Pesticide/PCBs				V	
TAL Inorganic				V	V
Lithium	V				
Acetonitrile/Acrylonitrile	V				
Explosives	V	V	V	V	
EPH	V				
Nitrite + Nitrate/ Chloride/Sulfate		III	III	III	
BOD		III			
COD		III			
TKN		III			
TP		III			

ARCS/P/MOUNDPLT/AH9

*******EXAMPLE No. 1*********

Sample Matrix	Parameter	Level of DQO	Investigative Samples (I.S.) No.	Freq.	total	Field Duplicates No.	Freq.	total	Field Blanks (1) No.	Freq.	total	MS/MSD No.	Freq.	total	Matrix (2) Total
			Field Quality Control												
1991-1996															
Deep Aquifer Ground-Water	VOCs	IV	12	Yearly	72	2	1 Every 10 I.S.	12	2	Daily	12	1	1 Every 10 I.S.	60	96
	9 additional VOCs not on TCL(see table 1)	V	12	Yearly	72	2	1 Every 10 I.S.	12	2	Daily	12	1	1 Every 10 I.S.	60	96
	1,4-Dioxane (FID)	V	3	Yearly	18	1	1 Every 10 I.S.	6	2	Daily	12	1	1 Every 10 I.S.	60	36
	1,4-Dioxane (PID)	V	9	Yearly	54	1	1 Every 10 I.S.	6	2	Daily	12	1	1 Every 10 I.S.	60	72
	Acid Extractables (3)	IV	12	Yearly	72	2	1 Every 10 I.S.	12	2	Daily	12	1	1 Every 10 I.S.	1	96
	pH	II	12	Yearly	12	2	1 Every 10 I.S.	12							24
	Conductivity	II	12	Yearly	12	2	1 Every 10 I.S.	12							24
	Temperature	II	12	Yearly	12	2	1 Every 10 I.S.	12							24

DQO Data quality objective.
I.S. Investigative sample.
MS Matrix spike.
MSD Matrix spike duplicate.
FID Flameionization detector.
PID Photoionization detector.
(1) Field blanks will only be collected if samples can not be collected directly from sample pumps.
(2) The matrix total does not include MS/MSD samples or trip blanks, which will consist of two - 40 ml vials in each cooler used to ship VOC samples.
(3) Acid extractable compounds may be dropped from the analyte list of the deep aquifer wells, if compounds from the acid extractable list are not detected in samples collected during 1991. In any case, the acid extractable compounds will be analyzed for every five years.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF: 5SMQA

MEMORANDUM

DATE: APR 30 1991

SUBJECT: Review of the First Draft Quality Assurance Project Plan - Addendum to the Laboratory Core Testing Plan for the Chemical Waste Management, Inc. Project in Vickery, Ohio

FROM: George C. Schupp, Chief
Quality Assurance Section

TO: Richard J. Zdanowicz, Chief
Underground Injection Control Section

ATTENTION: Jim Paulson, Project Coordinator

We have reviewed the first draft, Quality Assurance Project Plan (QAPjP) - addendum to the laboratory core testing plan for the Chemical Waste Management (CWM) Inc. project, which was received by the Quality Assurance Section (QAS) on February 22, 1991 (QAS Log-In No. 7). This subject QAPjP is poorly written. The scope of the project was not defined in the QAPjP, instead some of these information were referred to the document, "Laboratory Core Testing Plan (LCTP)", which was not included in the QAPjP package for review. Upon request, a copy of the LCTP (dated January 1991), was received by QAS on April 26, 1991. We will not recommend this subject QAPjP for approval until deficiencies listed in this memorandum are adequately addressed.

Our comments on the current draft QAPjP are summarized as follows:

I. TABLE OF CONTENT

The table of content should be revised to include the following:

A. The page number for each individual section and subsection.

B. List of tables, figures and Appendices that are included in the QAPjP.

C. The finalized version of the Laboratory Core Testing Plan should be attached to the QAPjP as appendix.

II. PROJECT DESCRIPTION

The descriptions provided in this section are nothing but generic statements. The scope of the project, parameters to be tested, etc., were not defined. Please address the following:

A. The project objectives, site description, site history and background, etc., should be briefly discussed in this section, and reference to the Laboratory Core Testing Plan (LCTP) for details.

B. Please provide the parameter list that contains the parameters to be tested as well as the required detection limits.

C. The intended usage of data to be generated from current activities, and the required level of data quality objectives (DQOs) should be clearly defined.

D. It was stated that a synthetic fuel liquid would be used for testing; however, no information regarding the composition of this synthetic fuel mixture was provided in the QAPjP.

III. PROJECT ORGANIZATION AND REPSONSIBILITY

A. Please identify the responsible parties for the following function:

1. Field sampling;

2. Final data assessment (final data review);

3. Internal and external system and performance audits of field activities (sampling and measurements) and laboratory analysis respectively.

B. Please provide a project organization chart.

IV. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION ACCURACY, COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY

The description provided in this section are too generic. Please revise it to address the following:

A. Define the terms of precision, accuracy, completeness, representativeness, and comparability, and identify the approaches to be used to assess them for the project.

B. Specify the acceptance control limits for precision, accuracy, completeness, etc. that are required for the project.

C. Describe the field QA efforts, which include the collections of quality control samples, to be implemented.

V. SAMPLING PROCEDURE

Please address the following:

A. Sampling procedures to be used should be described in details. If standard operating procedures (SOPs) for sample collection are attached, please identify the SOP by the title or its I.D. number.

B. Please provide explanation for the sample numbering system to be used. For example, what does a sample number of 44-3A mean?

C. A summary table of sample container, preservation, and holding time requirements should be included.

VI. SAMPLE CUSTODY

A. The description of sample custody is not complete. Please note that the sample custody consists of three major elements, namely chain-of-custody procedure for field activity (sampling and measurements), chain-of-custody for laboratory analysis, and the final evidence file. All of these three elements should be described explicitly:

1. Chain-of-custody for field activity

   The description should include the initiation of custody, sample labelling, documentation of field activity, custody transfer, etc.

2. Chain-of-custody for laboratory analysis

   The description should include procedures for sample receiving, sample log-in, storage, sample tracking during sample preparation and analysis.

3. Final evidence file

   The description of the final evidence file should include the evidence file custodian as well as contents. The evidence file should contain the results of field measurement, results of chemical analysis, correspondences, letters, field logbooks, lab logbooks, data review reports, etc.

B. The sentence, "Analyses will be performed on a 2-3 week turnaround basis." should be deleted.

C. Sample tracking form for sample tracking during the laboratory analyses (sample preparation and analysis) should be included.

VIII. CALIBRATION PROCEDURE AND FREQUENCY

A. Please delete the sentence and provide a brief description of the calibration procedure to be used for each instrument, and the frequency of performing the initial calibration, continuing calibration check, and/or recalibration.

B. Reference the calibration details to each individual SOP provided that the calibration procedure is completely documented in the referenced SOP.

IX. ANALYTICAL PROCEDURES

A. Please provide a brief description on parameters to be tested;

B. Analytical methods to be used. Identify the individual SOP for each analysis by the title or its ID number.

C. The methods for physical testing should also be identified.

D. Comments on SOPs are summarized as follows:

1. Preparation of Synthetic Waste Fluids (SOP 1.1)

   This SOP was not attached to the QAPjP for review. Please provide this SOP along with the revised QAPjP.

2. X-Ray Diffraction (SOP 2.2)

   The following should be included in the SOP:

   a. How the analytical results will be reported;

   b. Details on sample preparation should be provided.

3. Final Chemical Analyses on Composited Effluent at End of Each Plug Test (SOP 2.4)

   This is not a SOP, and should be combined with SOPs for chemical analysis. The SOP for chemical analysis should also describe the following:

a. Preparation of the composited effluents;

b. Sample containers, required sample volumes for each test, and sample preservation, etc.

4. pH Measurement of Fluid Sample (SOP 6.0A)

The following should be added:

a. Multiple measurements should be taken for the purpose of precision. This should be addressed in step 6.

b. Calibration should be checked after every 10 samples measured. Please add a sentence to step 6 to reflect this requirment.

c. It is appropriate to perform the initial calibration using pH 1.00 and 4.00 buffer solution. However, the pH meter should be recalibrated with buffer solution with pH greater than 7.00 if the pH of fluid samples exceed 7.00.

5. pH Measurement During Core Flow Testing (SOP 6.0 A1)

a. In Step 9, the corrective action to be taken should be spelled out.

b. Since the pH of the test fluid may change from acidic to basic after several recirculation, depending on the nature of the core, it may be appropriate to calibrate the pH meter using buffer solutions with pH 1.00 and 10.00.

6. Conductivity Measurement of Fluid Samples (SOP 6.0 C)

a. The step-wise details of calibration and sample measurement should be provided in the SOP.

b. Multiple measurements should be taken for the purpose of precision.

7. Conductivity Measurement During Core Flow Testing (SOP 6.0 C1)

a. In Step 3, the corrective action to be taken should be spelled out.

8. Organic Carbon, Total (SOP 6.0 D)

a. Since the determination of Total Organic Carbon (TOC) is not part of the parameter, this SOP should be deleted.

9. Sulfate by Method 375.4 Turbidimetric determination (SOP 6.0 E)

The copy of EPA manual can not be used to substitute for the required project-specific SOP. Please provide the required SOP. The following items should be included in the SOP:

a. Determination of background turbidity should be done for all samples. This is necessary because the fine particulates in the sample will cause false positive results. Substraction of background turbidity can be done as follows:

- o Measure the turbidity of each sample without addition of reagents, and use DI water as blank. Substract the reading from sample turbidity. Repeat this step for all samples. or
- o Use the sample solution without addition of reagents as, blank, and measure the sample turbidity.

b. The quality assurance/quality control (QA/QC) requirments should be part of the SOP. The QA/QC should include the initial calibration, continuing calibration check, analysis of blanks, duplicate analysis, etc. The following information should be included in each catagory where it is appropriate:

- o Frequency of performing the task or analysis;
- o Acceptance control limits to be used/required;
- o Concentration of standard solution to be used for calibration and/or calibration check, etc.

c. The data reporting requirements should also be specified in the SOP.

10. Acidity by Method 305.1 (SOP 6.0 F)

a. The preparation and standardization of sodium hydroxide and sulfuric acid solution that are to be used for titration should be described in the SOP.

b. A section should be added to address the QA/QC requirements.

11. Total Residue by Method 160.3 (SOP 6.0 G)

a. A section should be added to address the QA/QC requirements.

12. Non-Filterable Residue by Method 160.2 (SOP 6.0 H)

    a. A section should be added to address the QA/QC requirements.

13. Chloride by Method 325.3 (SOP 6.0 I)

    a. A section should be added to address the QA/QC requirements.

14. Alkalinity (SOP 6.0 J)

    a. Two methods, namely ASTM method 403 and EPA method 310.1 are included. It is not clear which method is to be used (or which is the primary method and which is the secondary if both methods are to be used). Please specify which method is to be used, and delete the other.

    b. A section should be added to address the QA/QC requirements.

15. Inductively Coupled Plasma Atomic Emission Spectroscopy (SOP 6.0 K)

    The following should be properly addressed:

    a. The concentration of each component in the mixed calibration standards to be used shpuld be specified.

    b. A section should be added to address the sample preparation. It is not acceptable to referred to SW-846 method 3005-3050. Furthermore, the sample should be digested without filtration.

    c. In Section 8.0 (Quality Control), the acceptance control limits should be specified.

    d. A section should be added to address the data reporting requirements.

X. INTERNAL QUALITY CONTROL CHECK

A. The description of this QAPjP element is not acceptable becase it fails to address the internal QC check. The correct documentation of this QAPjP element should include the internal QC check for both field activity and laboratory analysis:

1. For Field Activity (Sampling and Measurments)

   The description for field activity should include the colleciton of field QC sampes such as field blanks, field duplicate, etc.

2. For Laboratory Analysis

The internal QC checks for laboratory analysis should include the analyses of the following:

a. Method blank;

b. Reagent blanks;

c. Preparation (digestion/distillation) blanks;

d. duplicate analysis (inorganic analysis only);

e. Matrix spike/matrix spike duplicate samples (organic analysis only);

f. calibrations (initial calibration and continuing calibration check), etc.

NOTE: The acceptance control limit for each analysis should be specified.

XI. DATA REDUCTION, VALIDATION, AND REPORTING

This QAPjP element consists of three subelements, namely data reduction, data validation, and data reporting, respectively. Each subelement should be addressed explicitly:

A. Data Reduction

The procedures to be used to reduce the instrument printouts to the final reporting values were not addressed. Please provide these procedures accordingly.

B. Data Validation

The procedures and criteria to be used for data validation were not specified. Please address/reference them accordingly.

C. Data Reporting

The data reporting format to be used was not addressed. Please specify the content of the data package the laboratory is required to provide for the project.

XII. PERFORMANCE AND SYSTEM AUDITS

A. The description of this QAPjP element should include the internal and external audits of the field activities.

1. For internal field audits, please specify the party who is responsible for conducting the audits, the frequency of audits, and the procedures to be used for audits.

2. For external field audits, please state that the Central Regional Laboratory, CRL) and/or the Central District office (CDO) is responsible for the external field audits.

XIII. PREVENTATIVE MAINTENANCE

A. Please provide a brief description of procedure/frequency of preventative maintenance for each instrument.

XIV. SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

A. Please provide the equations to be used to calculate Percent Recovery (%R), Percent Relative Difference (%RPD), completeness, etc.

XV. CORRECTIVE ACTIONS

A. The statement, "Corrective action is not applicable to the scope of the QAPjP or the LCTP." is inaccurate. The corrective action is required for the QAPjP as well as LCTP. Corrective actions will be required at various stages of the project (i.e., field sampling, sample analysis, data review, etc.). Please address it accordingly.

XVI. QUALITY ASSURANCE REPORT TO MANAGEMENT

A. The quality assurance report should be prepared/submitted to the management on a monthly basis. The content of the report should include, as a minimum, the progress of the project, difficulities encountered, alternation of procedures if any, corrective action taken, etc.

If you have any questions regarding this memorandum, please contact Cheng-Wen Tsai, Chemist, of my staff at 886-6220.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

MAY 14 1991

REPLY TO ATTENTION OF:
5WD-TUB-9

VIA TELEFAX AND CERTIFIED MAIL P 324 733 435
RETURN RECEIPT REQUESTED

Mr. Fred Nicar, General Manager
Chemical Waste Management, Inc.
3956 State Route 412
Vickery, Ohio 43464

Re: Review of the Quality Assurance Project Plan (QAPP) for the Chemical Waste Management's Laboratory Core Testing Plan (LCTP)

Dear Mr. Nicar:

Your QAPP for the core testing program, dated February 20, 1991, has been reviewed by technical staff in the Underground Injection Control Section and in the Quality Assurance Section (QAS) of the Environmental Sciences Division. After examining the document for completeness and quality assurance criteria, numerous areas were noted that need further refinements so that the plan may be approved.

The QAPP must be revised to incorporate modifications to the LCTP that were agreed upon through negotiations after QAPP submission, and other changes requested in this letter and its enclosure. Detailed comments are provided below and in the enclosed letter from QAS. We have anotated the QAS comments to help CWM prioritize work on modifications to the QAPP; comments marked "A" are of a more critical nature than comments marked "B".

Section II. PROJECT DESCRIPTION

Please provide an amended parameter list that indicates measurement of dissolved rather than total metals, and the required detection limits. Please provide the composition of the synthetic waste liquid. Also for clarification, note that the plan should refer to silicate (SiO_2 aqueous) rather than silicon (Si^{4+}) as one of the analytical parameters.

Section III. PROJECT ORGANIZATION

Clarify on page 2 that the objectives of testing include possible changes in the injection zone due to exposure of waste from injection and from casing leaks prior to 1984.

Section IV. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA...

Identify the quality assurance manager who is responsible for project organization and line authority.

Section VI. SAMPLE CUSTODY

The preservation of samples for metals analysis must be amended as metals samples must be filtered prior to transfer to bottles and preserved with nitric acid prior to placement in coolers. Please provide a summary table of sample container, preservation, and holding times requirements.

Section IX. ANALYTICAL PROCEDURES

Subsections 1.1, 1.2, 2.4, 3.2

Please amend the plan to indicate that metals will be measured as dissolved constituents, and refer to silicate rather than silicon as one of the chemical parameters. Also, please provide some additional information on the procedures that will be used to test for dissolved silicate such as whether normal digestion or hydrofluoric acid will be used in the method.

Subsection 5.0

Please amend the plan to include a set of Standard Operating Procedures (SOP) on filtration for Phase II samples.

Subsection 6.0A, and 6.0C

Please amend the plan to indicate that multiple measurements will be taken for precision. When standards are used for calibration of the conductivity meter, provide detailed information on the composition of the sodium chloride solution used. This information should include reference to mass and laboratory grade of ingredients.

Subsection 6.0, D-K

Please amend the plan to indicate that dissolved carbonate is on the list of parameters and provide the method of analysis. Please refer to silicate rather than silicon as a chemical parameter.

Please indicate what internal standards (20) will be used as a quality control measure in the x-ray diffraction testing to ensure correct determination of mineralogy.

Please provide acceptable control limits for precision, accuracy, completeness, etc. that are required for the project.

Please amend the plan to include total organic carbon on page 82 of 429.

Although we acknowledge the progress of reaching conditional approval of the LCTP, as indicated in our letter dated April 9, 1991, we remain concerned that the LCTP is not fully approved and has not been implemented as required by Condition 6 of the exemption, which gave an April 7, 1991, deadline for completion of the core tests. In view of your current failure to timely comply with Condition 6, we expect a revised and approvable QAPP to be submitted by CWM no later than June 14, 1991.

If there are any questions regarding requests made in this letter or in the enclosed letter from the Quality Assurance Section, please contact me at (312) 886-1502 or Jim Paulson at (312) 886-1497.

Sincerely yours,

Richard J. Zdanowicz, Chief
Underground Injection Control Section

enclosure

cc: Carl A. Wilhelm, Ohio Environmental Protection Agency
George C. Schupp, USEPA, Region V, ESD, Quality Assurance Section

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REPLY TO ATTENTION OF: 5SMQA

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b. Details on sample preparation should be provided.

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A This is not a SOP, and should be combined with SOPs for chemical analysis. The SOP for chemical analysis should also describe the following:

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A. The description of this QAPjP element should include the internal and external audits of the field activities.

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1. For internal field audits, please specify the party who is responsible for conducting the audits, the frequency of audits, and the procedures to be used for audits.

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2. For external field audits, please state that the Central Regional Laboratory, CRL) and/or the Central District office (CDO) is responsible for the external field audits.

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A. Please provide a brief description of procedure/frequency of preventative maintenance for each instrument.

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If you have any questions regarding this memorandum, please contact Cheng-Wen Tsai, Chemist, of my staff at 886-6220.

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A b. Sample containers, required sample volumes for each test, and sample preservation, etc.

4. pH Measurement of Fluid Sample (SOP 6.0A)

The following should be added:

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A b. Calibration should be checked after every 10 samples measured. Please add a sentence to step 6 to reflect this requirment.

B c. It is appropriate to perform the initial calibration using pH 1.00 and 4.00 buffer solution. However, the pH meter should be recalibrated with buffer solution with pH greater than 7.00 if the pH of fluid samples exceed 7.00.

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B a. In Step 9, the corrective action to be taken should be spelled out.

B b. Since the pH of the test fluid may change from acidic to basic after several recirculation, depending on the nature of the core, it may be appropriate to calibrate the pH meter using buffer solutions with pH 1.00 and 10.00.

6. Conductivity Measurement of Fluid Samples (SOP 6.0 C)

B a. The step-wise details of calibration and sample measurement should be provided in the SOP.

A b. Multiple measurements should be taken for the purpose of precision.

7. Conductivity Measurement During Core Flow Testing (SOP 6.0 C1)

B a. In Step 3, the corrective action to be taken should be spelled out.

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See our letter → a. Since the determination of Total Organic Carbon (TOC) is not part of the parameter, this SOP should be deleted.

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- o Measure the turbidity of each sample without addition of reagents, and use DI water as blank. Substract the reading from sample turbidity. Repeat this step for all samples. or
- o Use the sample solution without addition of reagents as, blank, and measure the sample turbidity.

b. The quality assurance/quality control (QA/QC) requirments should be part of the SOP. The QA/QC should include the initial calibration, continuing calibration check, analysis of blanks, duplicate analysis, etc. The following information should be included in each catagory where it is appropriate:

- o Frequency of performing the task or analysis;
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- o Concentration of standard solution to be used for calibration and/or calibration check, etc.

c. The data reporting requirements should also be specified in the SOP.

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a. The preparation and standardization of sodium hydroxide and sulfuric acid solution that are to be used for titration should be described in the SOP.

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A

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    The following should be properly addressed:

    a. The concentration of each component in the mixed calibration standards to be used shpuld be specified.

    b. A section should be added to address the sample preparation. It is not acceptable to referred to SW-846 method 3005-3050. Furthermore, the sample should be digested without filtration.

    c. In Section 8.0 (Quality Control), the acceptance control limits should be specified.

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    d. A section should be added to address the data reporting requirements.

X. <u>INTERNAL QUALITY CONTROL CHECK</u>

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A. The description of this QAPjP element is not acceptable becase it fails to address the internal QC check. The correct documentation of this QAPjP element should include the internal QC check for both field activity and laboratory analysis:

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A

2. For Laboratory Analysis

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b. Reagent blanks;

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d. duplicate analysis (inorganic analysis only);

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NOTE: The acceptance control limit for each analysis should be specified.

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B. Data Validation

The procedures and criteria to be used for data validation were not specified. Please address/reference them accordingly.

C. Data Reporting

B

The data reporting format to be used was not addressed. Please specify the content of the data package the laboratory is required to provide for the project.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF: 5SMQA

MEMORANDUM

DATE: APR 30 1991

SUBJECT: Review of the First Draft Quality Assurance Project Plan - Addendum to the Laboratory Core Testing Plan for the Chemical Waste Management, Inc. Project in Vickery, Ohio

FROM: George C. Schupp, Chief
Quality Assurance Section

TO: Richard J. Zdanowicz, Chief
Underground Injection Control Section

ATTENTION: Jim Paulson, Project Coordinator

We have reviewed the first draft, Quality Assurance Project Plan (QAPjP) - addendum to the laboratory core testing plan for the Chemical Waste Management (CWM) Inc. project, which was received by the Quality Assurance Section (QAS) on February 22, 1991 (QAS Log-In No. 7). This subject QAPjP is poorly written. The scope of the project was not defined in the QAPjP, instead some of these information were referred to the document, "Laboratory Core Testing Plan (LCTP)", which was not included in the QAPjP package for review. Upon request, a copy of the LCTP (dated January 1991), was received by QAS on April 26, 1991. We will not recommend this subject QAPjP for approval until deficiencies listed in this memorandum are adequately addressed.

Our comments on the current draft QAPjP are summarized as follows:

I. TABLE OF CONTENT

The table of content should be revised to include the following:

A. The page number for each individual section and subsection.

B. List of tables, figures and Appendices that are included in the QAPjP.

C. The finalized version of the Laboratory Core Testing Plan should be attached to the QAPjP as appendix.

II. PROJECT DESCRIPTION

The descriptions provided in this section are nothing but generic statements. The scope of the project, parameters to be tested, etc., were not defined. Please address the following:

A. The project objectives, site description, site history and background, etc., should be briefly discussed in this section, and reference to the Laboratory Core Testing Plan (LCTP) for details.

B. Please provide the parameter list that contains the parameters to be tested as well as the required detection limits.

C. The intended usage of data to be generated from current activities, and the required level of data quality objectives (DQOs) should be clearly defined.

D. It was stated that a synthetic fuel liquid would be used for testing; however, no information regarding the composition of this synthetic fuel mixture was provided in the QAPjP.

III. PROJECT ORGANIZATION AND REPSONSIBILITY

A. Please identify the responsible parties for the following function:

1. Field sampling;

2. Final data assessment (final data review);

3. Internal and external system and performance audits of field activities (sampling and measurements) and laboratory analysis respectively.

B. Please provide a project organization chart.

IV. QUALITY ASSURANCE OBJECTIVES FOR MEASUREMENT DATA IN TERMS OF PRECISION ACCURACY, COMPLETENESS, REPRESENTATIVENESS, AND COMPARABILITY

The description provided in this section are too generic. Please revise it to address the following:

A. Define the terms of precision, accuracy, completeness, representativeness, and comparability, and identify the approaches to be used to assess them for the project.

B. Specify the acceptance control limits for precision, accuracy, completeness, etc. that are required for the project.

C. Describe the field QA efforts, which include the collections of quality control samples, to be implemented.

V. SAMPLING PROCEDURE

Please address the following:

A. Sampling procedures to be used should be described in details. If standard operating procedures (SOPs) for sample collection are attached, please identify the SOP by the title or its I.D. number.

B. Please provide explanation for the sample numbering system to be used. For example, what does a sample number of 44-3A mean?

C. A summary table of sample container, preservation, and holding time requirements should be included.

VI. SAMPLE CUSTODY

A. The description of sample custody is not complete. Please note that the sample custody consists of three major elements, namely chain-of-custody procedure for field activity (sampling and measurements), chain-of-custody for laboratory analysis, and the final evidence file. All of these three elements should be described explicitly:

1. Chain-of-custody for field activity

   The description should include the initiation of custody, sample labelling, documentation of field activity, custody transfer, etc.

2. Chain-of-custody for laboratory analysis

   The description should include procedures for sample receiving, sample log-in, storage, sample tracking during sample preparation and analysis.

3. Final evidence file

   The description of the final evidence file should include the evidence file custodian as well as contents. The evidence file should contain the results of field measurement, results of chemical analysis, correspondences, letters, field logbooks, lab logbooks, data review reports, etc.

B. The sentence, "Analyses will be performed on a 2-3 week turnaround basis." should be deleted.

C. Sample tracking form for sample tracking during the laboratory analyses (sample preparation and analysis) should be included.

VIII. CALIBRATION PROCEDURE AND FREQUENCY

A. Please delete the sentence and provide a brief description of the calibration procedure to be used for each instrument, and the frequency of performing the initial calibration, continuing calibration check, and/or recalibration.

B. Reference the calibration details to each individual SOP provided that the calibration procedure is completely documented in the referenced SOP.

IX. ANALYTICAL PROCEDURES

A. Please provide a brief description on parameters to be tested;

B. Analytical methods to be used. Identify the individual SOP for each analysis by the title or its ID number.

C. The methods for physical testing should also be identified.

D. Comments on SOPs are summarized as follows:

1. Preparation of Synthetic Waste Fluids (SOP 1.1)

   This SOP was not attached to the QAPjP for review. Please provide this SOP along with the revised QAPjP.

2. X-Ray Diffraction (SOP 2.2)

   The following should be included in the SOP:

   a. How the analytical results will be reported;

   b. Details on sample preparation should be provided.

3. Final Chemical Analyses on Composited Effluent at End of Each Plug Test (SOP 2.4)

   This is not a SOP, and should be combined with SOPs for chemical analysis. The SOP for chemical analysis should also describe the following:

a. Preparation of the composited effluents;

b. Sample containers, required sample volumes for each test, and sample preservation, etc.

4. pH Measurement of Fluid Sample (SOP 6.0A)

The following should be added:

a. Multiple measurements should be taken for the purpose of precision. This should be addressed in step 6.

b. Calibration should be checked after every 10 samples measured. Please add a sentence to step 6 to reflect this requirment.

c. It is appropriate to perform the initial calibration using pH 1.00 and 4.00 buffer solution. However, the pH meter should be recalibrated with buffer solution with pH greater than 7.00 if the pH of fluid samples exceed 7.00.

5. pH Measurement During Core Flow Testing (SOP 6.0 A1)

a. In Step 9, the corrective action to be taken should be spelled out.

b. Since the pH of the test fluid may change from acidic to basic after several recirculation, depending on the nature of the core, it may be appropriate to calibrate the pH meter using buffer solutions with pH 1.00 and 10.00.

6. Conductivity Measurement of Fluid Samples (SOP 6.0 C)

a. The step-wise details of calibration and sample measurement should be provided in the SOP.

b. Multiple measurements should be taken for the purpose of precision.

7. Conductivity Measurement During Core Flow Testing (SOP 6.0 C1)

a. In Step 3, the corrective action to be taken should be spelled out.

8. Organic Carbon, Total (SOP 6.0 D)

a. Since the determination of Total Organic Carbon (TOC) is not part of the parameter, this SOP should be deleted.

9. Sulfate by Method 375.4 Turbidimetric determination (SOP 6.0 E)

The copy of EPA manual can not be used to substitute for the required project-specific SOP. Please provide the required SOP. The following items should be included in the SOP:

a. Determination of background turbidity should be done for all samples. This is necessary because the fine particulates in the sample will cause false positive results. Substraction of background turbidity can be done as follows:

- o Measure the turbidity of each sample without addition of reagents, and use DI water as blank. Substract the reading from sample turbidity. Repeat this step for all samples. or
- o Use the sample solution without addition of reagents as, blank, and measure the sample turbidity.

b. The quality assurance/quality control (QA/QC) requirments should be part of the SOP. The QA/QC should include the initial calibration, continuing calibration check, analysis of blanks, duplicate analysis, etc. The following information should be included in each catagory where it is appropriate:

- o Frequency of performing the task or analysis;
- o Acceptance control limits to be used/required;
- o Concentration of standard solution to be used for calibration and/or calibration check, etc.

c. The data reporting requirements should also be specified in the SOP.

10. Acidity by Method 305.1 (SOP 6.0 F)

a. The preparation and standardization of sodium hydroxide and sulfuric acid solution that are to be used for titration should be described in the SOP.

b. A section should be added to address the QA/QC requirements.

11. Total Residue by Method 160.3 (SOP 6.0 G)

a. A section should be added to address the QA/QC requirements.

12. Non-Filterable Residue by Method 160.2 (SOP 6.0 H)

    a. A section should be added to address the QA/QC requirements.

13. Chloride by Method 325.3 (SOP 6.0 I)

    a. A section should be added to address the QA/QC requirements.

14. Alkalinity (SOP 6.0 J)

    a. Two methods, namely ASTM method 403 and EPA method 310.1 are included. It is not clear which method is to be used (or which is the primary method and which is the secondary if both methods are to be used). Please specify which method is to be used, and delete the other.

    b. A section should be added to address the QA/QC requirements.

15. Inductively Coupled Plasma Atomic Emission Spectroscopy (SOP 6.0 K)

    The following should be properly addressed:

    a. The concentration of each component in the mixed calibration standards to be used shpuld be specified.

    b. A section should be added to address the sample preparation. It is not acceptable to referred to SW-846 method 3005-3050. Furthermore, the sample should be digested without filtration.

    c. In Section 8.0 (Quality Control), the acceptance control limits should be specified.

    d. A section should be added to address the data reporting requirements.

X. INTERNAL QUALITY CONTROL CHECK

A. The description of this QAPjP element is not acceptable becase it fails to address the internal QC check. The correct documentation of this QAPjP element should include the internal QC check for both field activity and laboratory analysis:

1. For Field Activity (Sampling and Measurments)

   The description for field activity should include the colleciton of field QC sampes such as field blanks, field duplicate, etc.

2. For Laboratory Analysis

The internal QC checks for laboratory analysis should include the analyses of the following:

a. Method blank;

b. Reagent blanks;

c. Preparation (digestion/distillation) blanks;

d. duplicate analysis (inorganic analysis only);

e. Matrix spike/matrix spike duplicate samples (organic analysis only);

f. calibrations (initial calibration and continuing calibration check), etc.

NOTE: The acceptance control limit for each analysis should be specified.

XI. DATA REDUCTION, VALIDATION, AND REPORTING

This QAPjP element consists of three subelements, namely data reduction, data validation, and data reporting, respectively. Each subelement should be addressed explicitly:

A. Data Reduction

The procedures to be used to reduce the instrument printouts to the final reporting values were not addressed. Please provide these procedures accordingly.

B. Data Validation

need to specify criteria used

The procedures and criteria to be used for data validation were not specified. Please address/reference them accordingly.

C. Data Reporting

The data reporting format to be used was not addressed. Please specify the content of the data package the laboratory is required to provide for the project.

XII. PERFORMANCE AND SYSTEM AUDITS

A. The description of this QAPjP element should include the internal and external audits of the field activities.

1. For internal field audits, please specify the party who is responsible for conducting the audits, the frequency of audits, and the procedures to be used for audits.

2. For external field audits, please state that the Central Regional Laboratory, CRL) and/or the Central District office (CDO) is responsible for the external field audits.

XIII. PREVENTATIVE MAINTENANCE

A. Please provide a brief description of procedure/frequency of preventative maintenance for each instrument.

XIV. SPECIFIC ROUTINE PROCEDURES USED TO ASSESS DATA PRECISION, ACCURACY, AND COMPLETENESS

A. Please provide the equations to be used to calculate Percent Recovery (%R), Percent Relative Difference (%RPD), completeness, etc.

XV. CORRECTIVE ACTIONS

A. The statement, "Corrective action is not applicable to the scope of the QAPjP or the LCTP." is inaccurate. The corrective action is required for the QAPjP as well as LCTP. Corrective actions will be required at various stages of the project (i.e., field sampling, sample analysis, data review, etc.). Please address it accordingly.

XVI. QUALITY ASSURANCE REPORT TO MANAGEMENT

A. The quality assurance report should be prepared/submitted to the management on a monthly basis. The content of the report should include, as a minimum, the progress of the project, difficulities encountered, alternation of procedures if any, corrective action taken, etc.

If you have any questions regarding this memorandum, please contact Cheng-Wen Tsai, Chemist, of my staff at 886-6220.

Chemical Waste Management, Inc.

3956 State Route 412
Vickery, Ohio 43464
419/547-7791

FEDERAL E

February 22, 1991

Mr. Richard J. Zdanowicz, Chief
Underground Injection Control Section
United States Environmental Protection Agency
Region V
230 South Dearborn St., 5WD-TUB-9
Chicago, Illinois 60604

Re: LCTP Quality Assurance Project Plan (QAPP)

Dear Mr. Zdanowicz:

Enclosed please find two (2) copies of the "Quality Assurance Project Plan" for the Laboratory Core Testing Plan (LCTP) to be performed by CWM Vickery. This QAPP was developed following the guidelines provided to CWM by USEPA Region V.

If you have any questions, please contact Mr. Steve Lonneman at 419-547-7791.

Sincerely yours,
Chemical Waste Management, Inc.

F.G. Nicar

Fred G. Nicar
General Manager

Attachments

cc w/attachments: Bob Heitman, CWM
Steve Lonneman, CWM
Agency Correspondence File

cc w/o attachments: Jim Paulson, USEPA
Rebecca Strom, USEPA
Greig Siedor, CWM
Jay Skabo, CWM
Dr. George Vander Velde, CWM
Sheryl Silberman, TWO

OAS log #7

MEETING ATTENDEE ROSTER

NATURE OF MEETING: [ ] PRE-QAPP [ ] QAPP [X] OTHER _____

DATE: 11/27/90 TIME: ____:____ [ ] A.M. [X] P.M.

LOCATION: 9th Floor TUB - UIC

PROJECT NAME: Chemical Waste Mgmt. (CWM) Laboratory Core Testing Program

CURRENT STATUS: [ ] PHASE____; [ ] RFA; [ ] RFI; [ ] CMS

[ ] ENFORCEMENT

[ ] PERMITTING

ATTENDEES;

NAME	ORGANIZATION	TELEPHONE
George Schupp	U S EPA QA Section	6-6221
☆ Jim Paulson [5WD-Tub-09]	USEPA UIC Section	6-1497
Rebecca Strom	USEPA UIC Section	6-6594
STEVE LONNEMAN	CWM - EASTLAKE, OH	419-547-7791
George Hudak	USEPA - UIC Section	(312) 353-4142
ABRAHAM LERMAN	Northwestern University	(708)491-3238
NATHAN WISER	USEPA UIC SECTION	312/353-9569
MIKE DANN	CORE LABORATORIES	214/466 2673
Bob Heitman	CWM Eastern Region	609/243 7966
Bob WHITESIDE	TEXAS World	713/850/0003
JIM SANDT	TEXAS World	713/850/0003
Hanlon Cowles2	USEPA	312/866/2939
Jessie Chiu	USEPA - UIC	312/886-1499

FORM GCS-1

Tentative

SUGGESTED AGENDA

MEETING WITH CHEMICAL WASTE MANAGEMENT (CWM) REGARDING TECHNICAL DETAILS OF LABORATORY CORE TESTING PROGRAM

November 27, 1990

CWM Presentations

- explanation of proposed testing ✓
- diagrams of the experimental set-up ✓
- representative wastes ✓
- planned chemistry work (
- quality assurance measures

Discussion Areas

- detection and/or deduction of porosity and permeability changes
- length of flowthrough runs up in air!
- re-circulation of pore volumes until stabilization occurs in middle
- implementation of the testing program and compliance with exemption condition
- submission of a separate quality assurance project plan

Definition of chemical parameter, their testing method
Amt. + Nature of QC samples
Amt. of sample to collect
Waste specific interferences.

MEETING ATTENDEE ROSTER

NATURE OF MEETING: [ ] PRE-QAPP [ ] QAPP [✓] OTHER _____

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MIKE DANN	CORE LABORATORIES	214/466 2673 Dallas
Bob Heitman	CWM Eastern Region	609/243 7966
Bob WHITESIDE	TEXAS World	713/550/0003
JIM SANDT	TEXAS World	713/550/0003
Harlan Cornish	USEPA	312/866/2939
Jessie Chiu	USEPA - UIC	312/886-1499

FORM GCS-1